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# MONTHLY PROGRESS REPORT ★ SECTION 7

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# HEALTH

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OFFICE OF THE SURGEON GENERAL

HEADQUARTERS, ARMY SERVICE FORCES, WAR DEPARTMENT

# HEALTH

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# DISEASE AND INJURY

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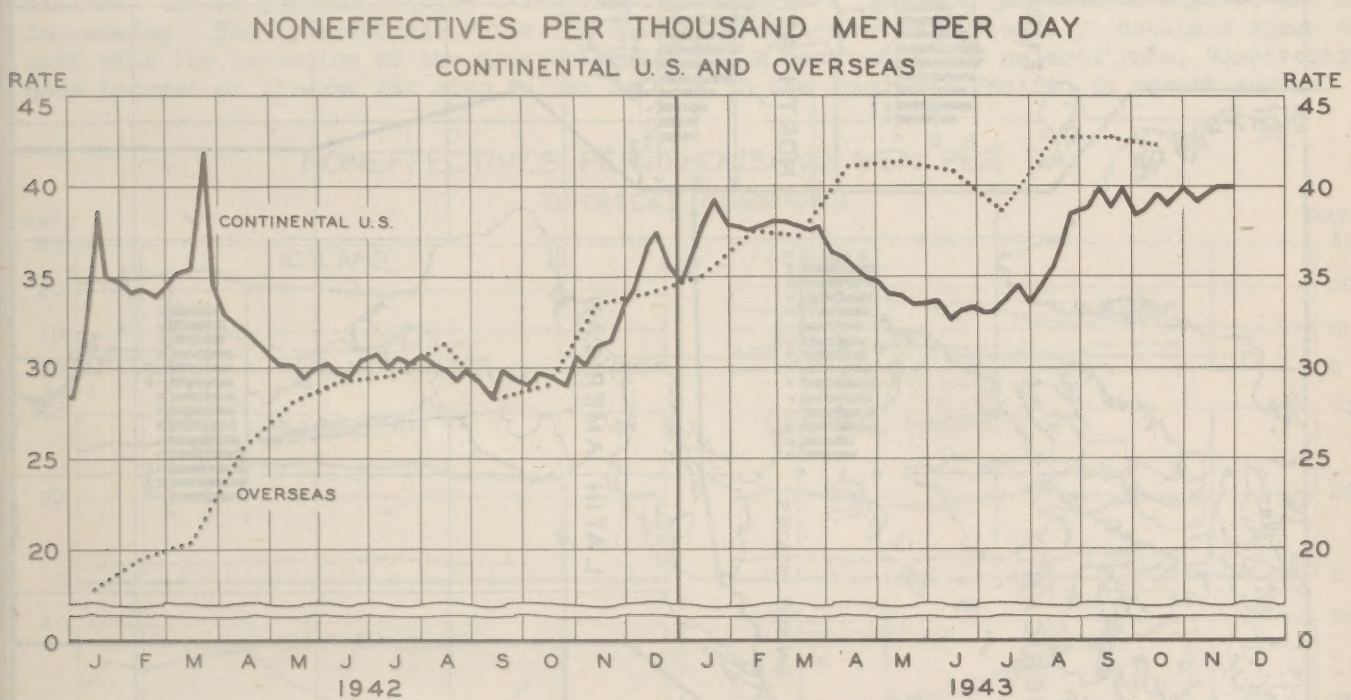
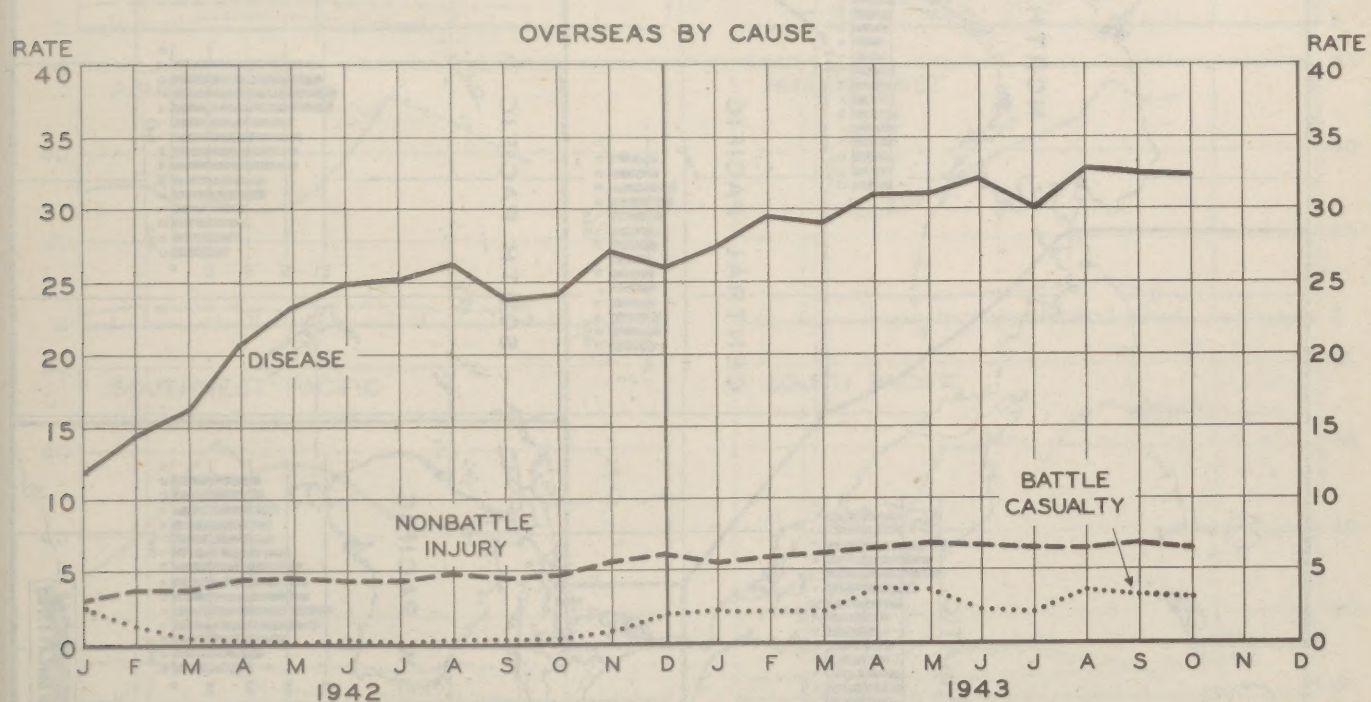
## NONEFFECTIVE RATES, U. S. AND OVERSEAS

Despite a sharp increase in the admission rate for disease among troops in the Continental U. S. during the last two weeks of November, there was very little change in the average daily noneffective rate during the month. For three months the rate has been in the vicinity of 38 to 40 noneffectives per thousand men per day.

The noneffective rate for overseas troops declined very slightly during October, according to preliminary estimates. The major components of the total overseas rate shown in the first panel are traced in the second panel below. As a cause of noneffectiveness disease continues to outweigh both battle and nonbattle injury many times. The most recent points are quite tentative, being based largely upon radio reports.

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# NONEFFECTIVES PER THOUSAND MEN PER DAY

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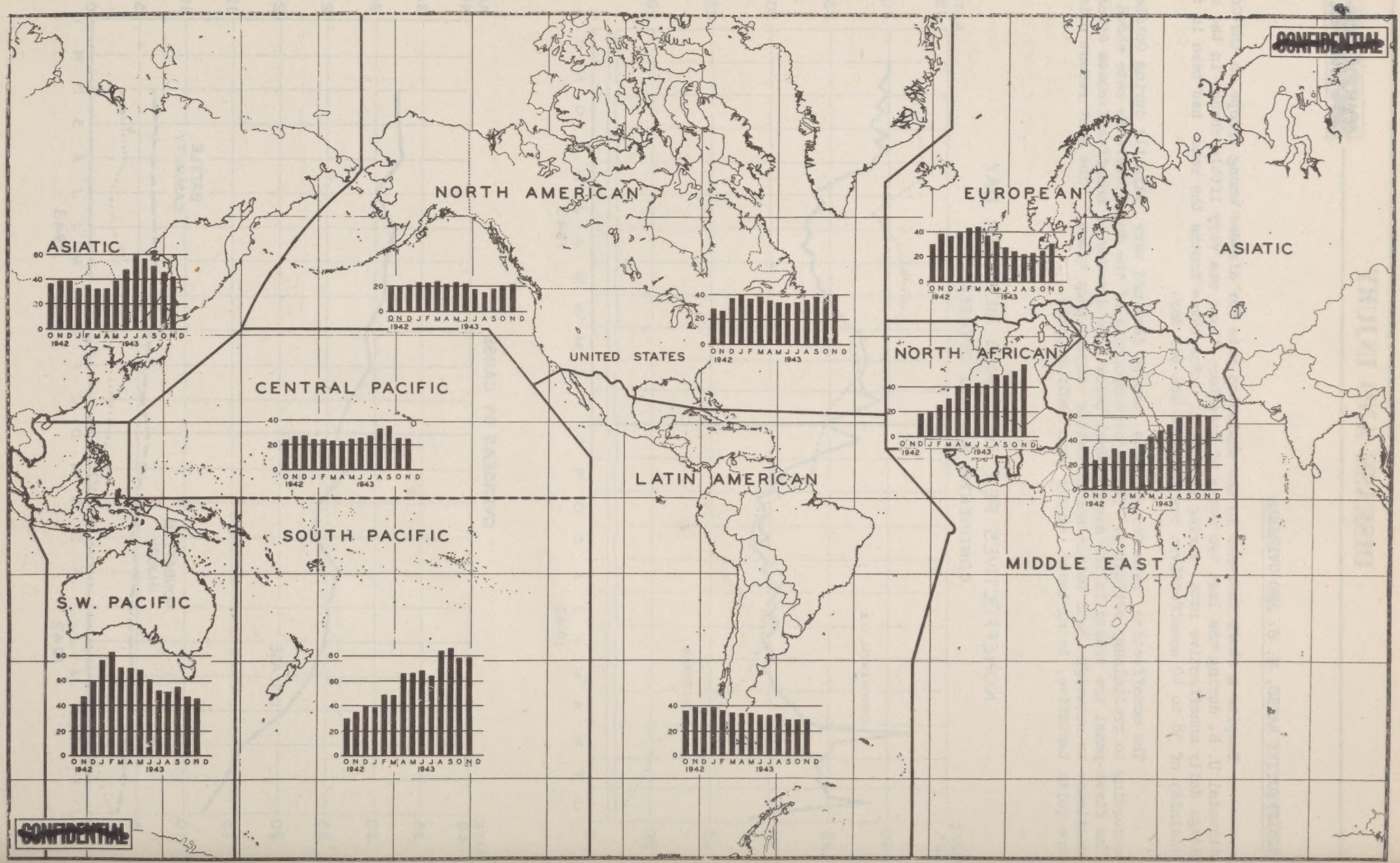


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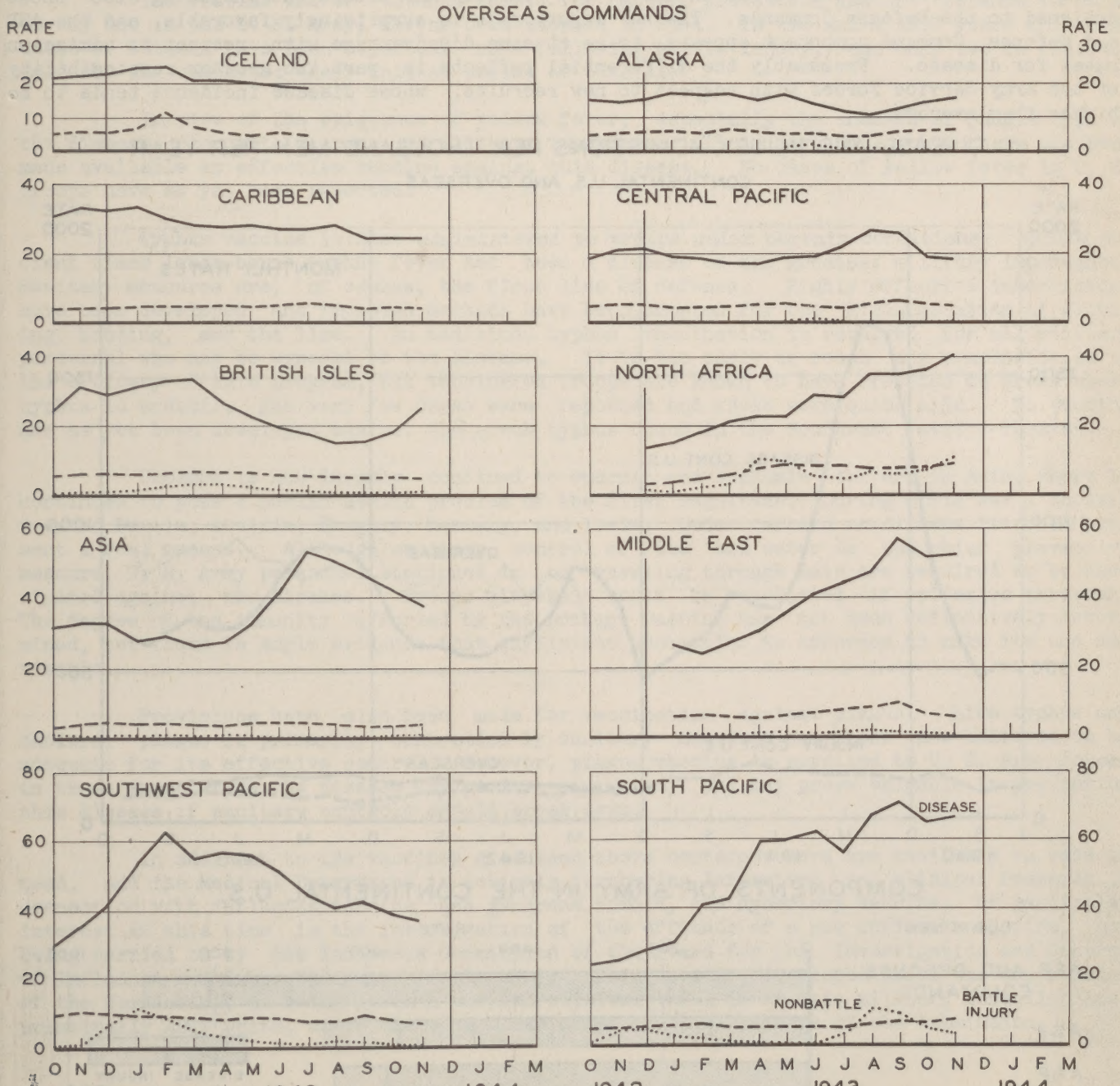
NONEFFECTIVE RATES OVERSEAS

The noneffective rate, measuring the cumulative effect of admissions to hospital and quarters, and the length of time lost, is the best index to the health of the Army. In the charts which follow, the total rates shown on the map across the page are separated into their components attributable to disease, injury, and battle casualty. Points for the most recent months are quite provisional, being based on radio reports.

Only in North Africa and the South Pacific does noneffectiveness because of battle injury currently assume any magnitude. At several points it has even exceeded the noneffectiveness associated with nonbattle injury in these two commands. In all theaters disease remains the prime cause of noneffectiveness. The rates for the North African, South Pacific, and Middle East Theaters have increased steadily since January 1943, in large part because of malaria, diarrhea and dysentery, and other diseases of increased prevalence under combat conditions. Rates for the British Isles, having reached a seasonal minimum in August, are now increasing. The provisional rates for the Asiatic Theater have steadily declined since August with the cessation of the monsoon season and a decline in the malaria rate. Noneffectiveness because of disease has also fallen notably in the Southwest Pacific in recent months.

NONEFFECTIVES PER THOUSAND MEN PER DAY

OVERSEAS COMMANDS



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## DISEASE AND NONBATTLE INJURY

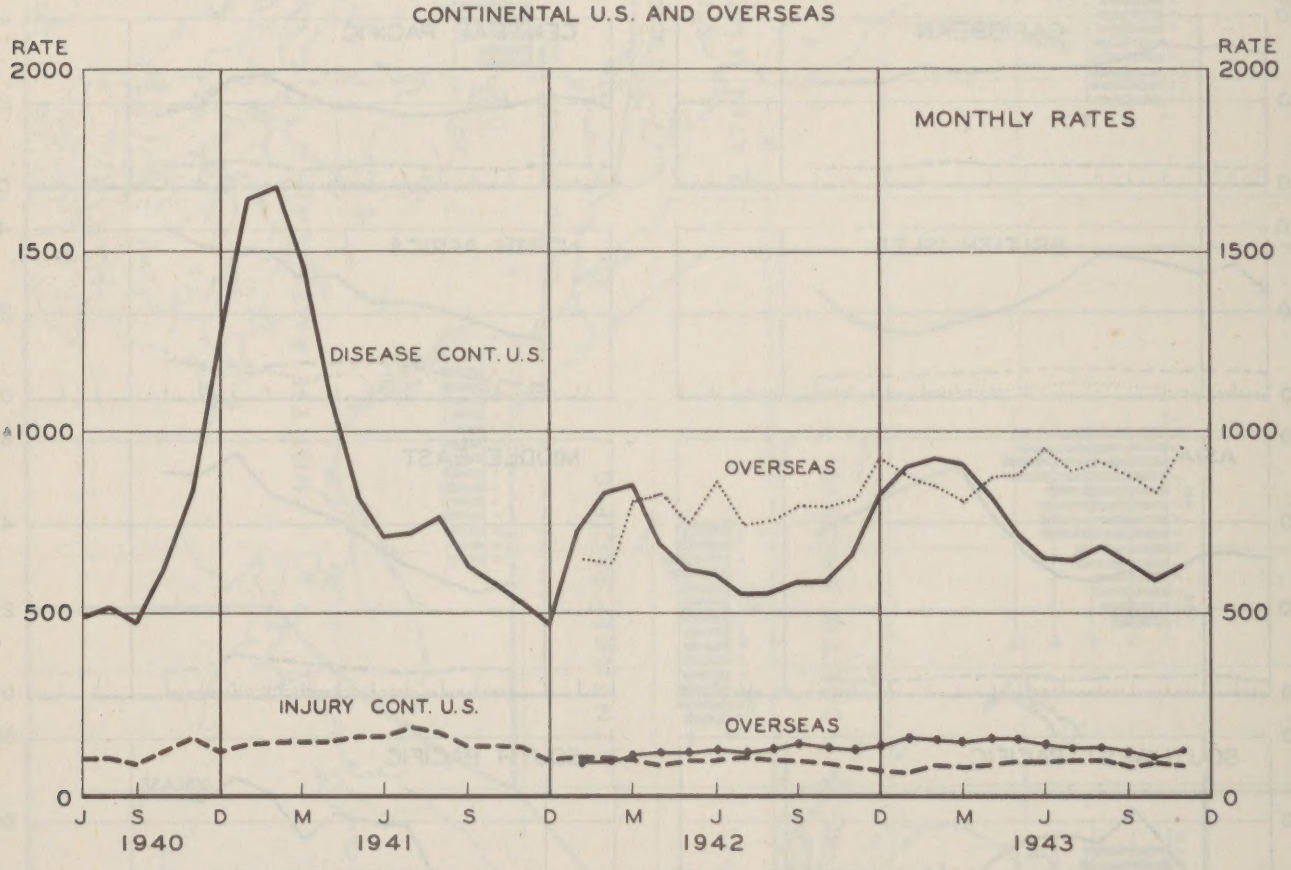
According to preliminary reports, the admission rate for disease among troops in the Continental U. S. advanced about 5 percent during November to reach 623 admissions per 1,000 men per year. For the week ending 27 November it was 673, however, having increased sharply above that of 630 for the previous week. The rise is attributable to a marked increase in respiratory infection, but it must be borne in mind that the disease rate has been relatively favorable and exceptionably stable during the early fall months. There was no real change in the injury rate during November, the provisional rate of 90 for October having been lowered to 82 on the basis of final returns.

The disease and injury rates among overseas forces continue at a higher level than those among troops in the Continental U. S. The provisional estimate of 950 for overseas forces during November represents a marked increase, however, which derives from the experience of troops in the British Isles. Radio reports suggest that the admission rate in this theater advanced precipitately during November.

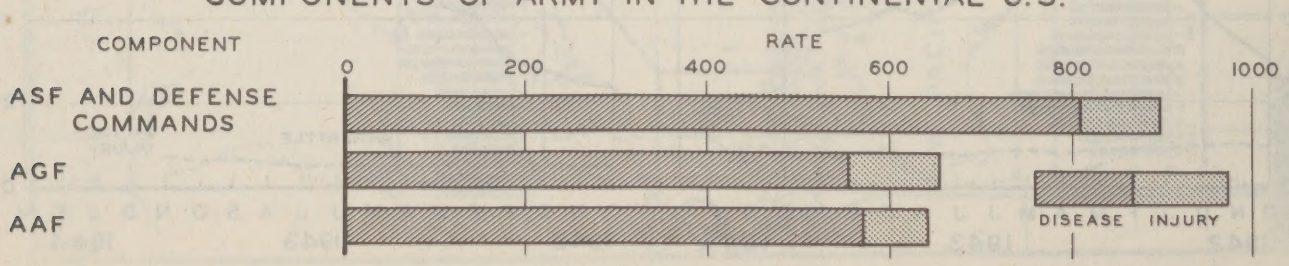
The second chart below compares the major components of the troops in the U. S. from the standpoint of admission rates for disease and injury during September. Separate reports prepared by the Air and Ground Surgeons make it possible to compare the AGF and AAF rates with the rest of the forces in the U. S., chiefly ASF troops but including also those assigned to the Defense Commands. The AAF injury rate is surprisingly favorable, and the ASF and Defense Command component appears to be at some disadvantage with respect to admission rates for disease. Presumably the differential reflects in part the greater responsibility of the Army Service Forces with respect to new recruits, whose disease incidence tends to be higher than average.

DISEASE AND INJURY, ADMISSIONS PER THOUSAND MEN PER YEAR

CONTINENTAL U.S. AND OVERSEAS




COMPONENTS OF ARMY IN THE CONTINENTAL U.S.



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# DISEASE AND INJURY

## DISEASE PREVENTION THROUGH IMMUNIZATION

The problems of disease prevention in the present war are undoubtedly the greatest with which the U. S. Army has ever been confronted. No small part of the success achieved to date derives from the extensive immunization program. The regular immunization procedures available for troops during the last war were essentially limited to vaccination against smallpox, typhoid fever, and the paratyphoid fevers. In this war six active immunizations are being employed more or less routinely, and other procedures may be used when the circumstances warrant.

Smallpox vaccination was the first immunization to be practiced in the U. S. Army, and smallpox has been virtually non-existent since the turn of the century when the policy of universal vaccination was adopted.

Typhoid vaccination is also one of the routine immunization procedures, and has been compulsory since 1910. As in World War I, the Army is using a triple vaccine against typhoid and the paratyphoid fevers, the effectiveness of which is well demonstrated by the rarity with which these diseases now occur among U. S. Army personnel despite their undoubted exposure in certain overseas areas.

The routine use of tetanus toxoid for active protection against tetanus is relatively new in the U. S. Army, having been adopted in 1941. In two and a half years only nine cases of tetanus have been reported, none following battle injury, and only two in individuals who had completed their initial series of toxoid.

In view of the existence of yellow fever, especially the endemic or jungle-type of the disease, in certain areas of military importance, it is fortunate that there has been made available an effective vaccine against this disease. No cases of yellow fever in U. S. troops have as yet been reported.

Typhus vaccine is also administered to troops under certain conditions. Since ancient times louse-borne typhus fever has been a disease of the greatest military importance. Sanitary measures are, of course, the first line of defense. Highly effective insecticides have been developed and improved methods have been adopted for the disinfestation of clothing, bedding, and the like. In addition, typhus vaccination is required for all military personnel who may be exposed to the disease. It is too early to reach any conclusion as to the efficacy of this program, but vaccinated troops are known to have operated in areas where typhus is endemic, yet very few cases were reported and these were quite mild. No vaccine has as yet been developed against the scrub typhus found in the Southwest Pacific Theater.

Cholera is now largely confined to endemic and epidemic centers in Asia, where it continues to pose a public health problem of the first magnitude. During World War I cholera reached Russia, Austria, Hungary, Germany, and Italy. Under certain conditions it could present a real menace. Although sanitary control of food and water is the chief preventive measure, U. S. Army personnel stationed in or traveling through Asia are required to be vaccinated against the disease. Troops elsewhere could be vaccinated if epidemics threaten. The degree of the immunity afforded by the present vaccine has not been definitively determined, but there is ample evidence that sufficient protection is afforded to make its use advisable.

Provisions have also been made for vaccination against plague. Like typhus and cholera, plague is primarily controlled by sanitary measures and these are believed to be adequate for its effective control. However, plague vaccine is supplied to U. S. Army forces in those areas where the disease may present a problem, and may prove valuable in preventing this disease if sanitary controls should break down.

In addition to the vaccines discussed above certain others are available in case of need, and the Medical Department is actively furthering laboratory and clinical research in connection with influenza vaccine, gas gangrene toxoid, and dysentery vaccine. Of particular interest at this time is the investigation of the efficacy of a new influenza vaccine, now being carried on by the Influenza Commission of the Board for the Investigation and Control of Influenza and Other Epidemics in the Army. This vaccine, developed under the supervision of the Commission, is being given a careful clinical trial in certain military installations, principally ASTP units, where there is close observation by members of the Commission.

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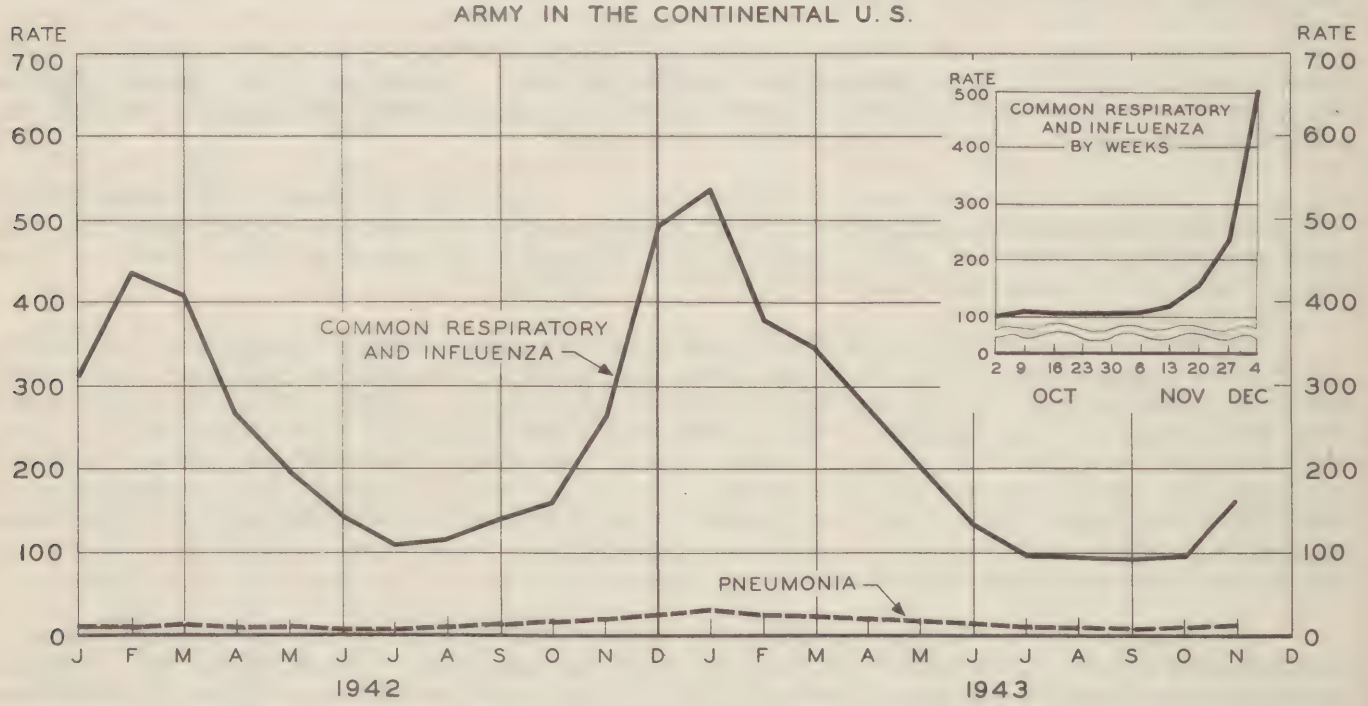
RESPIRATORY DISEASE, CONTINENTAL U. S.

After an exceptionally stable admission rate over a period of four months, the incidence of respiratory disease began a sharp upward climb during the week ending 20 November and reached 516 for the week ending 4 December. For September, October, and November the rates are 93, 98, and 161 for common respiratory disease and influenza. However, for the week ending 6 November the rate was 103, and for the week ending 13 November only 113; thereafter it rose rapidly to 150, 231, and 501 for the last two weeks of November and the first week of December. The accompanying chart details the changes, the inset in the upper right-hand corner containing the weekly rates plotted to a different scale.

Although the 5th, 6th, and 7th Service Commands had the highest rates at the end of the period, relatively large increases are evident in the rates for all the service commands except the 8th and 9th. The bottom chart compares the service command rates for the last two weeks in November and the first week in December.

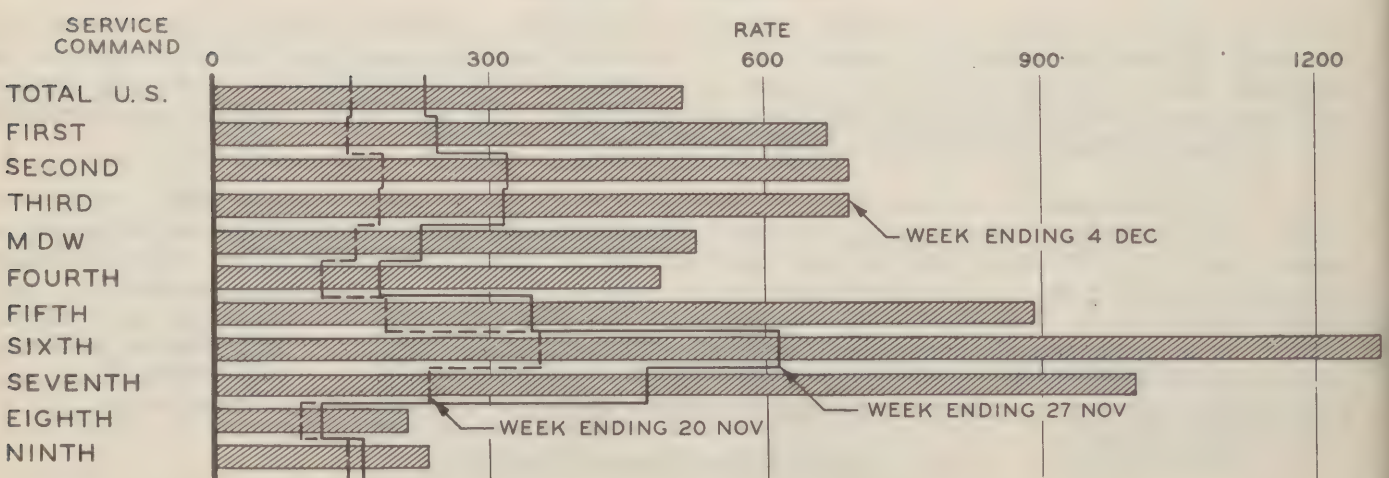
RESPIRATORY DISEASE, ADMISSIONS PER THOUSAND MEN PER YEAR

ARMY IN THE CONTINENTAL U. S.




COMMON RESPIRATORY DISEASE AND INFLUENZA

SERVICE COMMANDS



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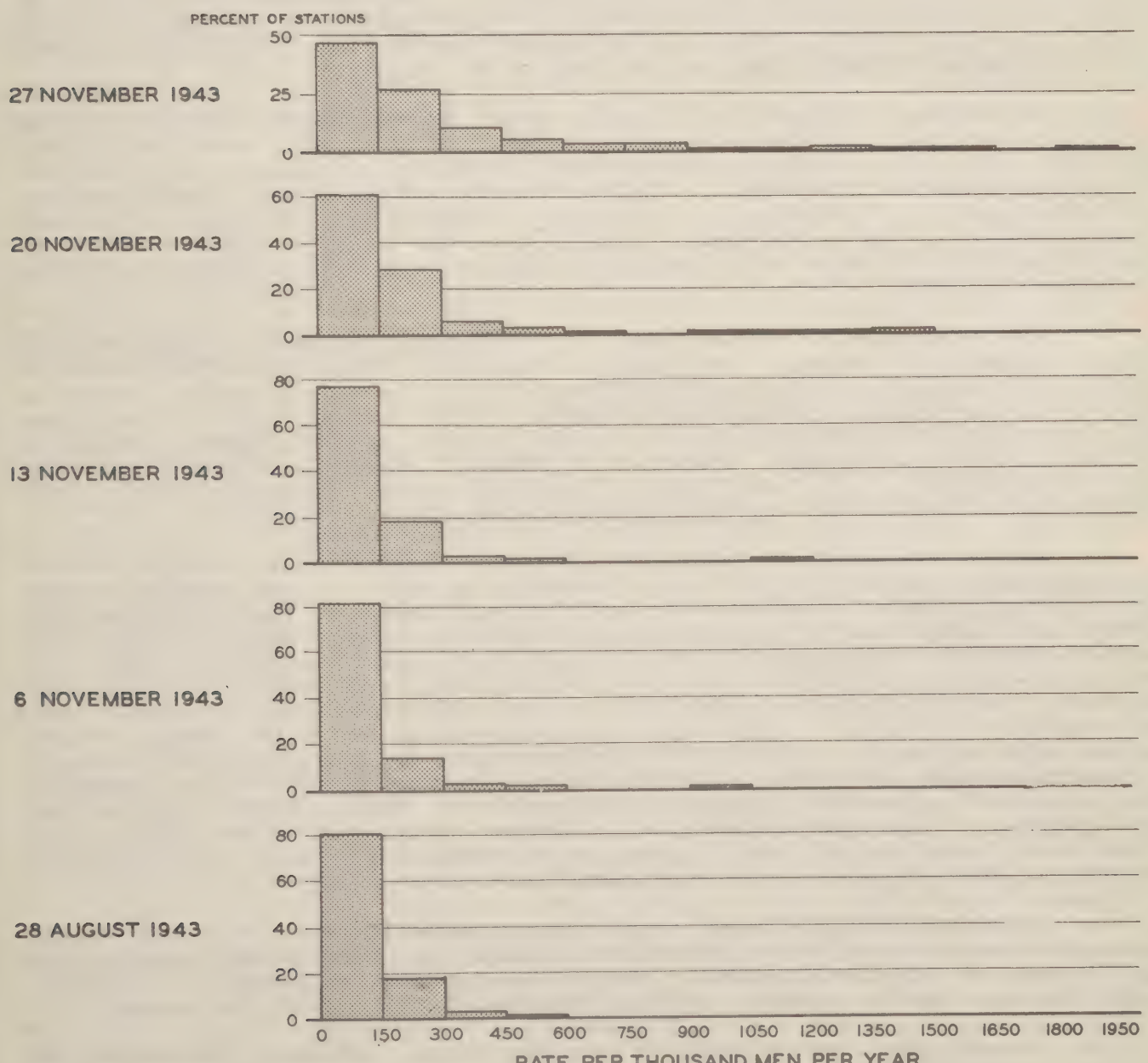
RESPIRATORY DISEASE, CONTINENTAL U. S. (Continued)

The sharp increase in the prevalence of respiratory disease in the Army is paralleled by a somewhat similar situation in the civilian population. A widespread epidemic of mild influenza is now in its early phase. The special diagnostic facilities of the Board for the Control of Epidemics in the U. S. Army are proving highly useful in determining whether or not influenza is actually present. The strategic location of the laboratory facilities of the Board will furnish early and competent information on the distribution and type of virus present and thus facilitate the task of control. To date influenza A has been demonstrated in four widely separated areas.

In the chart below the stations having 5,000 or more strength are grouped according to their admission rates for total respiratory disease during five selected weeks. In August and in early November 80 percent of the stations had rates under 150 admissions per 1,000 men per year, but by 27 November this had fallen to 47 percent. During the latter week about 15 percent reported rates in excess of 450 admissions per 1,000 strength per year.

DISTRIBUTIONS OF STATIONS*BY ADMISSION RATE
FOR ALL RESPIRATORY DISEASE
ARMY IN THE CONTINENTAL U.S.




* Strength greater than 5000.

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## MEDICAL ASPECTS OF THE RECENT NEW GEORGIA CAMPAIGN

A technical medical report recently received from the South Pacific Theater provides information of general interest in connection with the occupation of New Georgia and adjacent islands of the Solomons group. Although it is not yet possible to state with precision the relative importance of disease and battle casualty in this campaign, it did provide additional testimony that the probable incidence of disease (including neuropsychiatric disorder) warrants major consideration in planning any operation. Excluding 1,000 deaths from enemy action there were at least 13,500 admissions for disease and injury among a force of about 35,000 at maximum, the initial landing force being much smaller. Of this number of admissions 27 percent were wounded in action and 11 percent otherwise injured, 21 percent admitted for malaria, 19 percent for neuropsychiatric disorders, 18 percent for diarrheal disease, and 4 percent for respiratory and other diseases.

The initial amphibious operation began on 30 June 1943, and the campaign was successfully completed 22 September 1943. Guadalcanal and the Russell Islands were the jumping-off points and also served as base areas of supply and hospitalization for the forces of occupation. All branches of the service were represented, but Army personnel, chiefly the 43rd, 37th, and 25th Divisions less certain units, predominated. The 43rd and 37th had not previously seen action. During the first week of operations the medical facilities ashore were extremely limited, and heavy bombing produced more casualties than could be handled satisfactorily. Final counts are not yet available, but the estimates of the surgeon of the 14th Corps include 811 Army personnel killed in action, 48 Navy personnel, and 132 Marines, roughly 1,000 in all. Perhaps 15 percent were killed by aerial bombing and strafing and 85 percent on the field of battle, especially by automatic weapons fire. Approximately 50 percent of the deaths occurred in the first two weeks of the campaign.

In addition to those killed in action, about 3,700 were wounded, including Navy and Marine Corps personnel. For Army personnel the ratio of killed to total casualties was about 20 percent, rather close to the average World War I experience (excluding gas casualties) and less than the World War II averages for the South Pacific and for the war to date, according to A.G.O. reports. The proportion of men dying of wounds is said to have been as low as 2 percent prior to arrival in base areas. Sixty-five percent of the wounds involved the extremities and a certain amount of gas gangrene is reported to have occurred among the wounded evacuated to the rear.

The neuropsychiatric problem proved to be especially serious in the early and more difficult stages of the campaign, resulting in a high rate of evacuation for this cause. In all there were roughly 2,500 neuropsychiatric casualties of one sort or another, principally men with temporary symptoms precipitated by fatigue and the emotional stress of jungle combat. The problem was particularly grave in the 43rd Division, involving almost 10 percent of its total strength during July. The pattern of admission suggests a process of contagion within and among units, with "mass" breaks by some small groups. The nearby units of other divisions are believed to have been influenced by the experience of the 43rd.

Study of the records of neuropsychiatric evacuees and of other evidence convinced the surgeon that incompetent or questionable leadership in small units was operating as a major precipitating factor. The number evacuated from each company or similar unit was found to be in direct proportion to the number of unit leaders evacuated. Many unit leaders were unable to control the developing symptoms of the men, and in some instances the junior officers or non-commissioned officers were the first to break, with demoralizing effect upon their men. Some units which had already begun to crack were held together by superior leaders assigned for the purpose. The analysis prepared by the surgeon of the campaign stresses the need which each soldier has for such orientation toward his task as only good leadership can provide, and also the importance of both good discipline and physical fitness. Enemy action, unfamiliar jungle noises, presence of fellow-soldiers with psychiatric symptoms, and combat fatigue are also cited as precipitating factors. Roughly half of the cases are said to have been "combat fatigue" and 75 percent of them recovered in three or four days with rest and good care. Recurrences were rare among those returned to duty.

In addition to battle casualties and neuropsychiatric disorders, diarrheal disease and malaria were outstanding causes of noneffectiveness during the New Georgia campaign. Venereal disease was conspicuously absent. Respiratory disease was only moderately prevalent. Fungus infections were quite common, involving approximately 25 percent of the command.

Common diarrheal disease was quite prevalent in July, moderately so in August, and much lower in September. Until the middle of August about 10 percent of the command was affected each week, but some remained on duty status. The Army admission rate was roughly 500 per thousand men per year in August and 350 in September. The average period of noneffec-



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MEDICAL ASPECTS OF THE RECENT NEW GEORGIA CAMPAIGN (Continued)

tiveness was four days. All the common diarrhea may be attributed to improper field sanitation, especially with regard to messes, kitchens, and latrines. The limited water supply and combat conditions posed additional difficulties. Flies were a serious problem throughout the campaign because of improper waste disposal, lack of screening, and perhaps also because of the extensive destruction of jungle vegetation. In his report on the campaign the surgeon of the 14th Corps takes a very strong stand on the value of screening and other sanitary supplies for units going into combat. The poor quality of field sanitation in the New Georgia campaign indicates again that the basic training of the average soldier has been deficient in this extremely important respect. What applies to the individual soldier also applies to the unit commander, regardless of grade, who too seldom fully appreciates that proper sanitation is a function of command. A number of units of the occupation force were depleted by unnecessary intestinal diseases which could have been prevented by tight sanitary discipline.

Malaria was an important cause of noneffectiveness, not so much because of new infection acquired during the campaign as because of recurrent malaria which broke through suppressive treatment. New infection in this malarious area is said to have been well controlled by efficient anti-malarial measures. All three divisions had been exposed to malaria on Guadalcanal, although most of the 43rd had been on the virtually malaria-free Russell Islands for several months. The 25th Division was thoroughly saturated with malaria, having had 8,000 admissions during six months on Guadalcanal. Immediately prior to the campaign the 25th had a malaria admission rate of about 1,500 per 1,000 men per year. The 43rd had a rate of about 300 and the 37th one of 100 per 1,000 men per year. During the New Georgia campaign there were in excess of 2,900 admissions from malaria in the entire command, and an average admission rate of 600 to 700 or more per 1,000 per year. Taken in relation to their experience immediately prior to combat, the several divisions did not have an appreciable increase in malaria admissions during the occupation. The 25th Division, in fact, has a somewhat more favorable rate than it had experienced on Guadalcanal.

Nonbattle injuries also contributed to noneffectiveness during the campaign. There were roughly 1,500 nonbattle injuries with about 20 deaths. During the initial landing operation no Army hospitals were available, and two clearing stations handled the heavy load of casualties. A 24-hour evacuation policy was in operation for the first two weeks. On 28 July one field hospital of 250 beds was opened (and dive-bombed ten days later), on 6 September another of 125 beds, and on 29 September a third of 380 beds. At the outset the shortage of hospital and clearing station facilities was acute, and it was rendered the more difficult by personnel shortages in divisional units.

Evacuation from the combat area was primarily by water to Russell Islands and to Guadalcanal. For the first four weeks each LST returning to Guadalcanal had but one Naval medical officer aboard to care for an average of 100 or more casualties, some having had only first aid treatment. Evacuation of casualties by water was accomplished without loss of life caused by enemy action, however. It soon was possible to provide better pre-evacuation care and to restrict evacuation to those patients whose condition was suitable. Near the end of July an additional Navy medical officer was placed aboard each LST.

During the period 30 June to 31 August 6,700 patients were evacuated, 5,700 being Army patients. During September an additional 1,500 were evacuated, bringing the total to 8,200 for the campaign, or perhaps 60 percent of all the admissions for disease and injury. The 43rd Division alone lost 4,800 by evacuation. The ratio of water to air evacuation is about 8 to 1, according to the reported figures, air evacuation having been used sparingly.

The operational lessons of the campaign were numerous. Forward surgical teams, suitable for air transportation, were found to be essential. These were staffed with personnel from general hospitals in the rear. Three such teams were found necessary to support adequately an infantry division in this type of combat. Medical, surgical, and neuropsychiatric consultants and an orthopedic surgeon were also found to be necessary during combat operations and have been assigned to the division going into combat. The heavy losses suffered by the evacuation of men who needed only rest and care to be returned promptly to their units, especially those suffering from combat fatigue, also demonstrated the necessity of a convalescent camp which will follow the division into combat. The New Georgia experience also taught the necessity for more adequate hospital facilities in support of the division. Consequently, a field hospital of 380 beds and an evacuation hospital have been assigned to the division. In order to facilitate the diagnosis of tropical diseases it was found imperative to assign suitable laboratory personnel to the combat division. Experienced malaria survey and control units have also been so assigned. All these changes are in the direction of giving even a small task force adequate control over noneffectiveness and of thus making it better able to accomplish its mission.

# MALARIA, ADMISSIONS PER THOUSAND MEN PER YEAR

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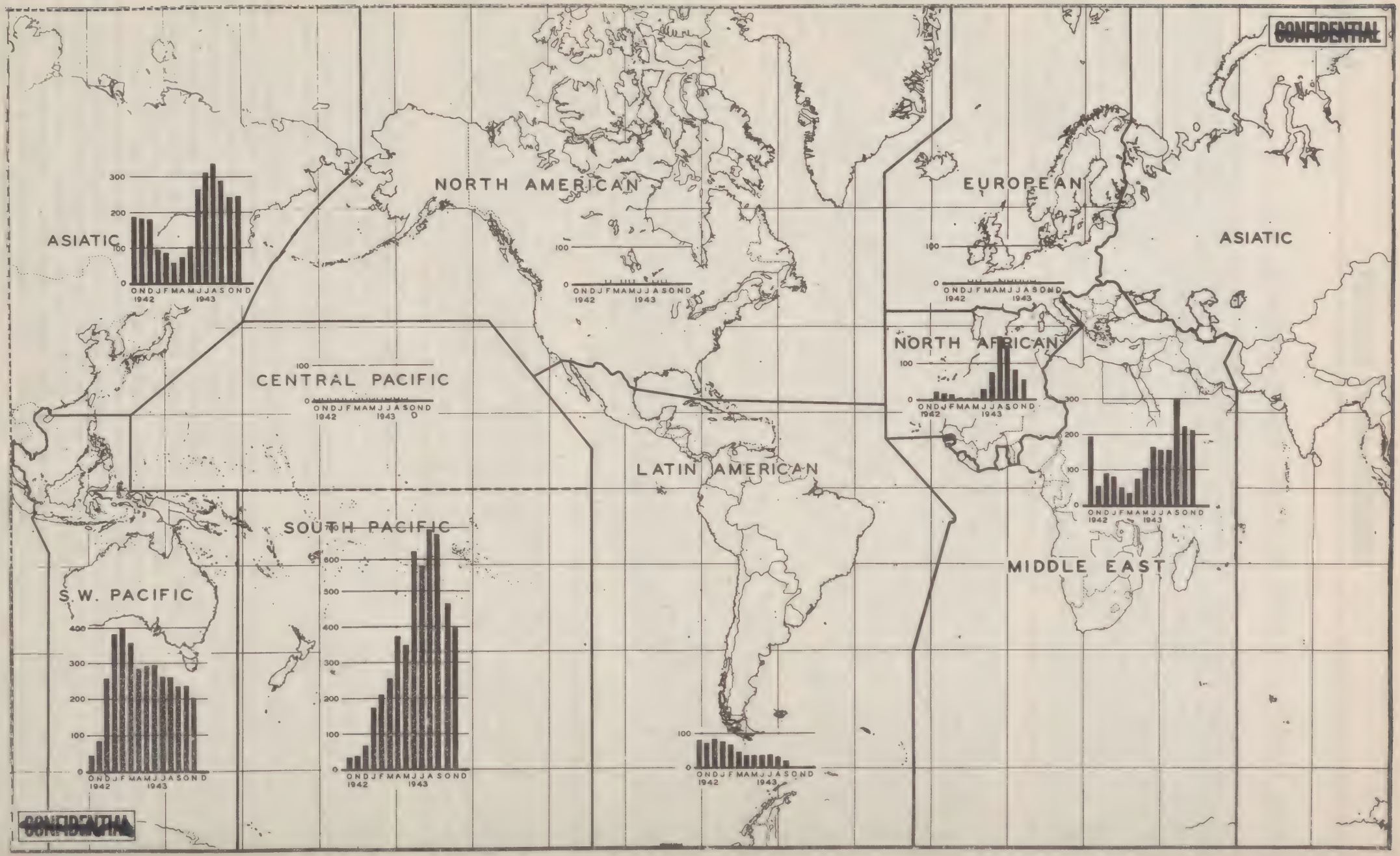


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# DISEASE AND INJURY

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MALARIA

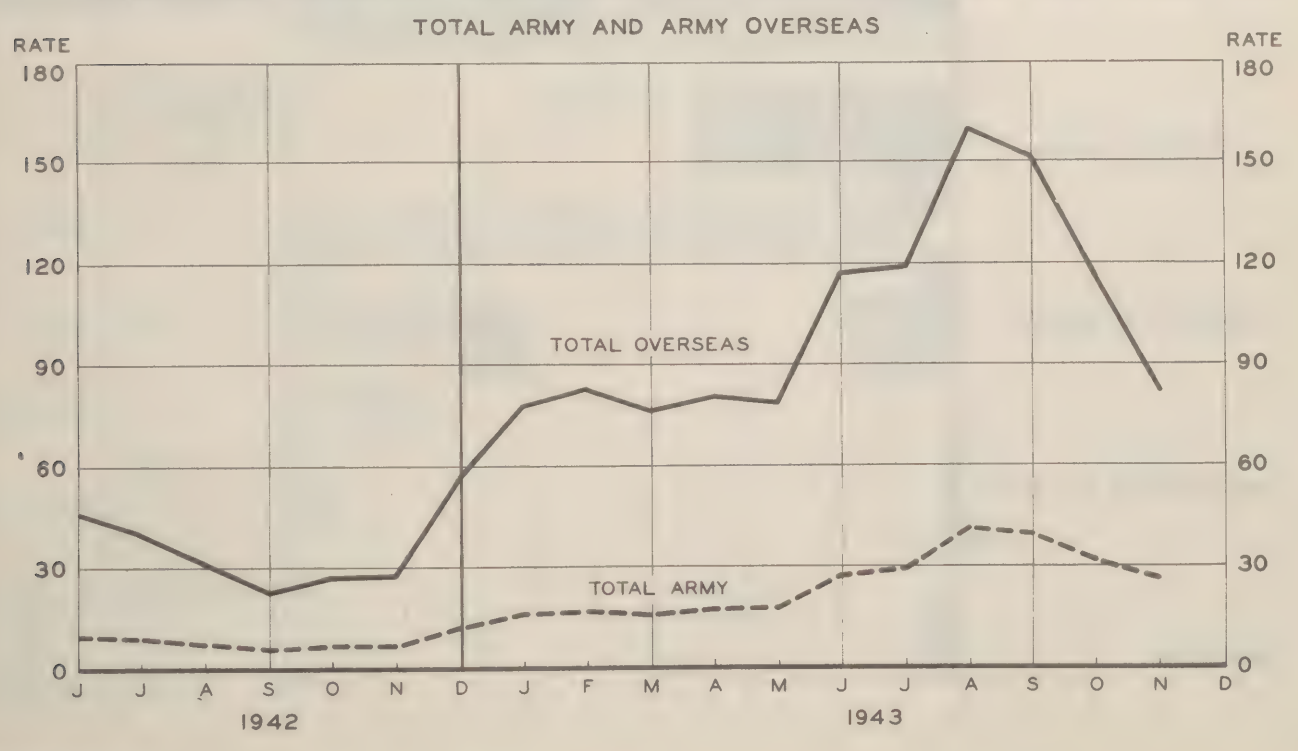
According to preliminary telegraphic reports to The Surgeon General, the admission rates for malaria declined substantially during October and November in North Africa, the South Pacific, and in China, Burma, and India. A lesser decline occurred in the Middle East, and in the Southwest Pacific. The improvement in North Africa and in Asia is largely seasonal. More complete data on the South Pacific experience during October bring the rate for that month somewhat below the preliminary rate previously reported. A lesser correction has been made in the September rate for the Middle East, but this rate is still provisional.

Malaria is an outstanding medical problem in the Asiatic Theater, the highest reported incidence being for troops stationed in Assam. Seventy-three percent of the first 2,400 admissions to the 20th General Hospital near Ledo were for malaria, and at one time 55 percent of their beds were occupied by malaria patients.

Despite a real decline in its incidence, according to preliminary telegraphic reports, malaria continues to be the main medical problem in the South Pacific Theater. A recent report detailing the experience of the Americal Division is especially illuminating. With its evacuation to nonmalarious Fiji in March 1943, suppressive atabrine was discontinued and a high rate of admission for malaria was experienced. The peak of the noneffectiveness from the malaria contracted on Guadalcanal was reached 24 weeks after evacuation, when the weekly admission rate reached 4,200 per thousand men per year with 89 initial attacks and 936 relapses, involving 8.1 percent of the command. During the week ending 13 October, two months later, a rate of 3,000 prevailed, with 31 initial attacks and 698 relapses, involving 5.9 percent of the command. After seven months without re-infection, in other words, there has been little improvement in the noneffectiveness caused by malaria. A study of 1,611 consecutive malaria admissions on the part of personnel of the Americal Division reveals that 75 percent of the cases relapsed within ten weeks subsequent to the first admission and 77 percent within 15 weeks. Several different treatment schedules, varying atabrine dosage and length of treatment, were used. However, none of these lowered the average relapse rate below 63 percent. The same report from the South Pacific also indicated that the 25th Division, having been through the Guadalcanal and New Georgia campaigns and in malarious areas for more than 11 months, was about to be sent to New Zealand for rehabilitation.

Although malaria presents an acute problem in only certain theaters, there is sufficient strength in these areas to result in a fairly high rate of admission for all overseas forces and even for the entire Army. The accompanying chart gives a preliminary series of rates through November 1943.

DIAGNOSED MALARIA, ADMISSIONS PER THOUSAND MEN PER YEAR

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## HEALTH OF JAPANESE FORCES STATIONED AT RABAUL, NEW BRITAIN

A Japanese Medical Department report captured at Munda, on New Georgia, makes possible certain interesting comparisons between Japanese troops in the 8th Army area and American troops on New Guinea. The document gives detailed data for February 1943, and a summary for December 1942 and January 1943.

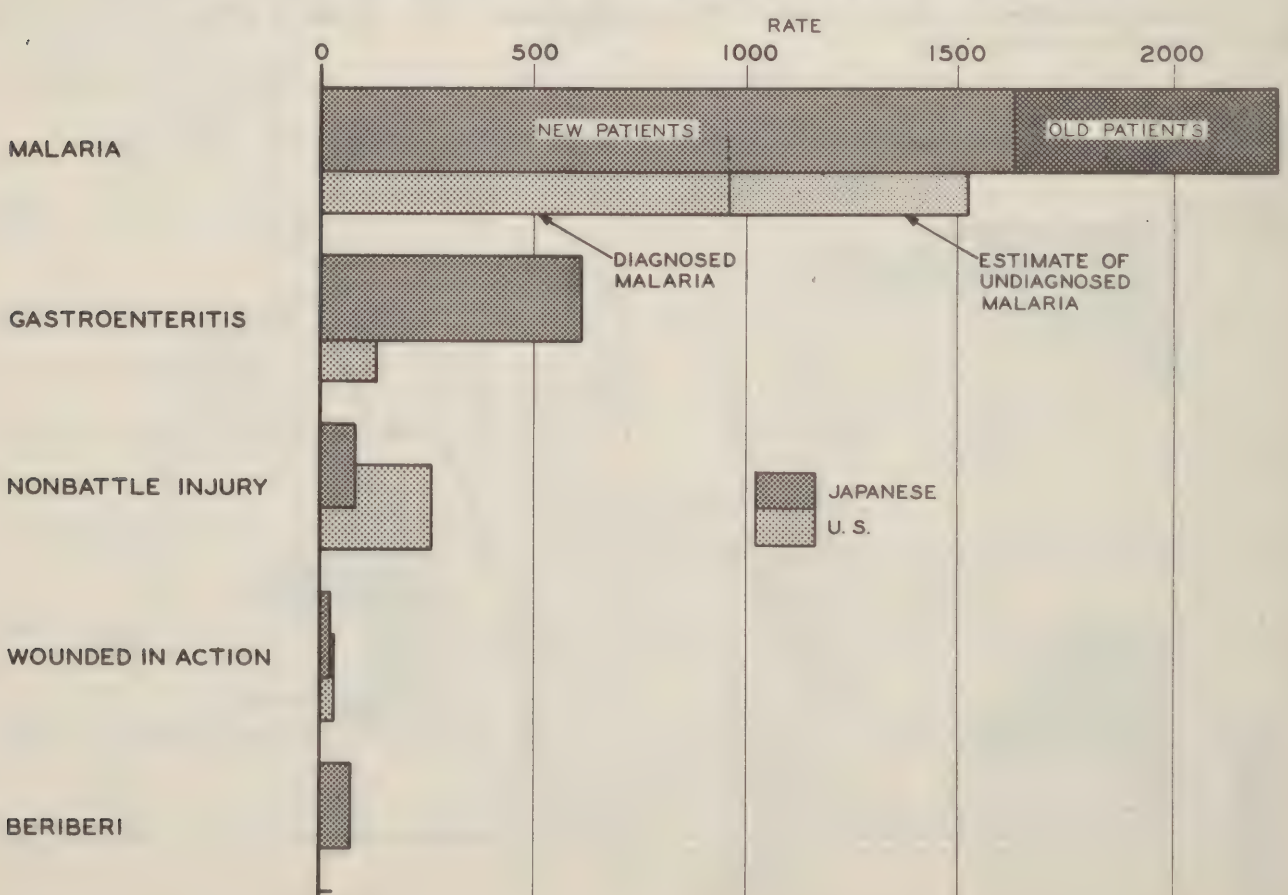
At the time the report was prepared Japanese troops had been in the Rabaul area for at least eight months, and their estimated average strength was 51,382 in December and 79,901 in February. The strengths are "estimated" in the sense that the translation mentions the number of "personnel examined". It is assumed that this number is the strength of the force from which the admissions were drawn. The area was served by two base hospitals having, with their annexes, a combined capacity in excess of 4,000 beds. Altogether, including an unspecified number of field hospitals, there were at least 8,800 beds, or about 11 percent of the troop strength during February. During the three-month period, the health of the Japanese troops was considerably less favorable than was that of the American forces on New Guinea. For all causes, including battle casualty, the average admission rate for the entire period was 4,086 per 1,000 men per year for the Japanese troops, approximately twice that experienced by the American units.

Malaria was the greatest single cause of admission and noneffectiveness among Japanese troops during this period, causing 17,112 new admissions and 5,415 readmissions. This number of cases represents 37 percent of the mean strength and 35 percent of all admissions for the three months. During the same period diagnosed malaria accounted for 34 percent of all admissions among U. S. troops on New Guinea. The average admission rate for malaria was 1,440 per thousand men per year for the Japanese and 718 for U. S. troops, if only diagnosed malaria be counted. The average noneffective rate for malaria among the Japanese troops was roughly 40 per thousand men per day.

The accompanying chart compares Japanese and American admission rates for several diagnoses during February. The Japanese rate for malaria has been separated into two parts

ADMISSIONS PER THOUSAND MEN PER YEAR—FEBRUARY 1943

JAPANESE FORCES, RABAUL AREA - U.S. TROOPS, NEW GUINEA



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HEALTH OF JAPANESE FORCES STATIONED AT RABAUL, NEW BRITAIN (Continued)

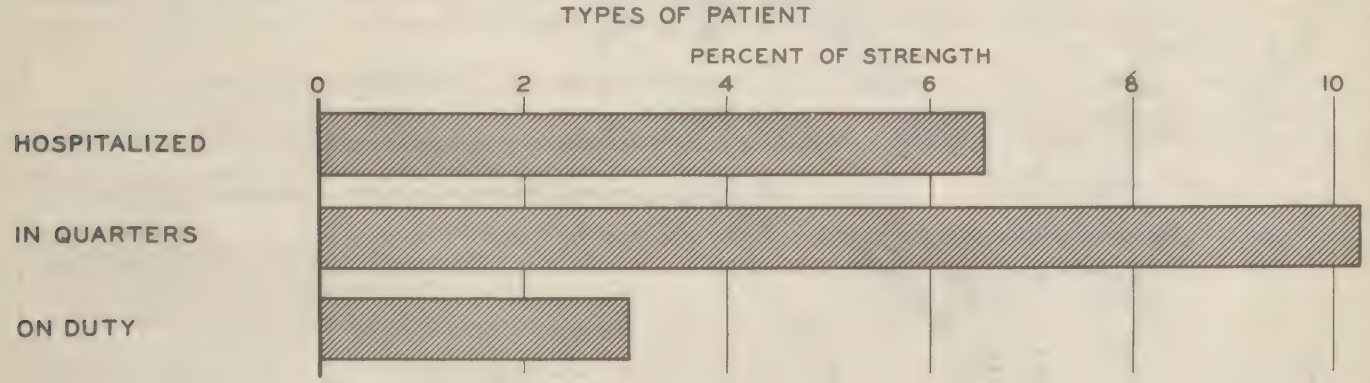
representing new patients and old patients, while the rate for U. S. forces on New Guinea shows the incidence of diagnosed malaria together with an increment representing three-quarters of undiagnosed fever. The comparison of the malaria admission rates depends to some extent upon the completeness of diagnosis. It has been customary at U. S. headquarters in the Southwest Pacific Theater to assume that about three-quarters of the undiagnosed fever admissions were probably malaria. The Japanese report makes no mention of undiagnosed fever, and the completeness with which malaria is diagnosed by Japanese medical officers is not known. However, the Japanese rate must be taken as a minimum if it is to be compared to the estimated total malaria rate for U. S. troops. The moderately high incidence of beriberi among the Japanese is of interest inasmuch as statements of prisoners of war and captured enemy equipment and supplies all indicate that the Japanese are very "vitamin conscious" and have issued vitamins to all troops.

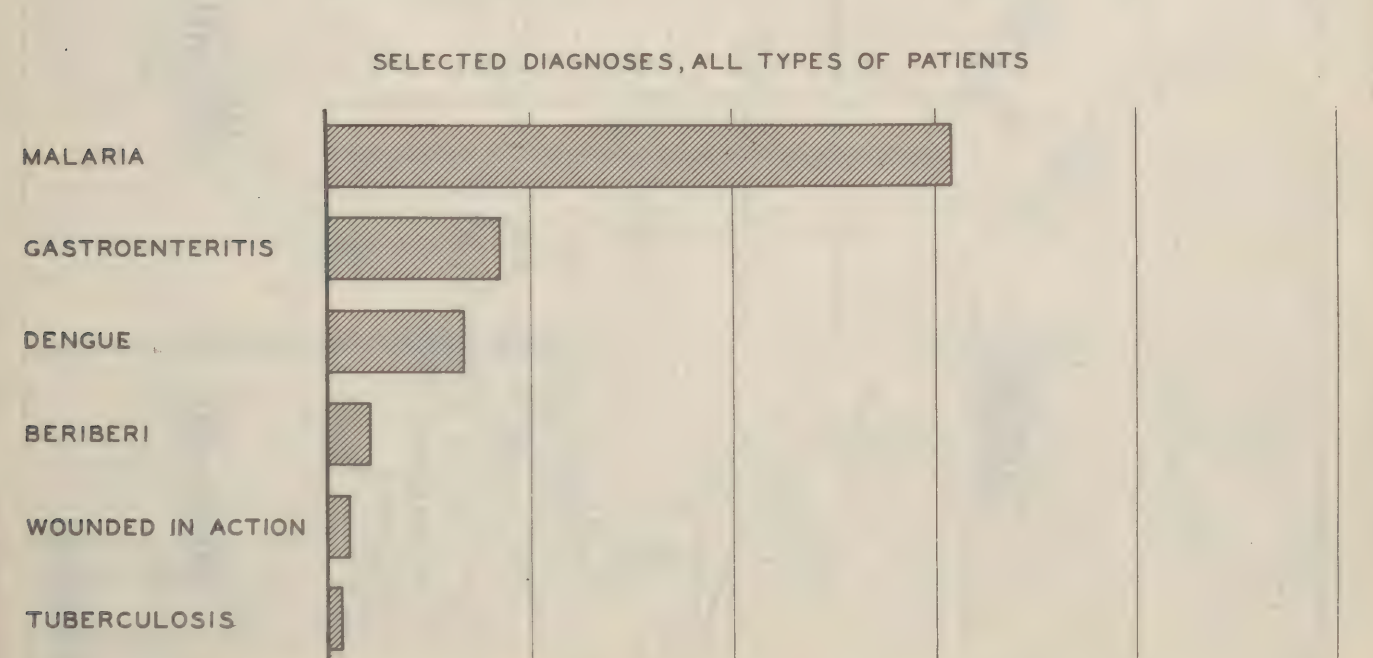
During February 3,776 Japanese troops were treated for enteric diseases, which represents a rate of 615 per 1,000 men per year. On 22 March there were 37 Japanese hospitalized for typhoid fever, 146 for paratyphoid, and 140 for dysentery. The number of cases reported is interesting in view of the fact that the Japanese are known to be conducting an immunization program against these three diseases.

At the end of February there were 72,916 Japanese troops in the Rabaul area, 20 percent of whom were receiving medical care. The chart below gives the classification of patients under medical supervision. For all types of patient it also shows the proportions under treatment for selected diagnoses.

CLASSIFICATION OF JAPANESE PATIENTS UNDER MEDICAL TREATMENT

28 FEBRUARY 1943



# DIARRHEA AND DYSENTERY, ADMISSIONS PER THOUSAND MEN PER YEAR

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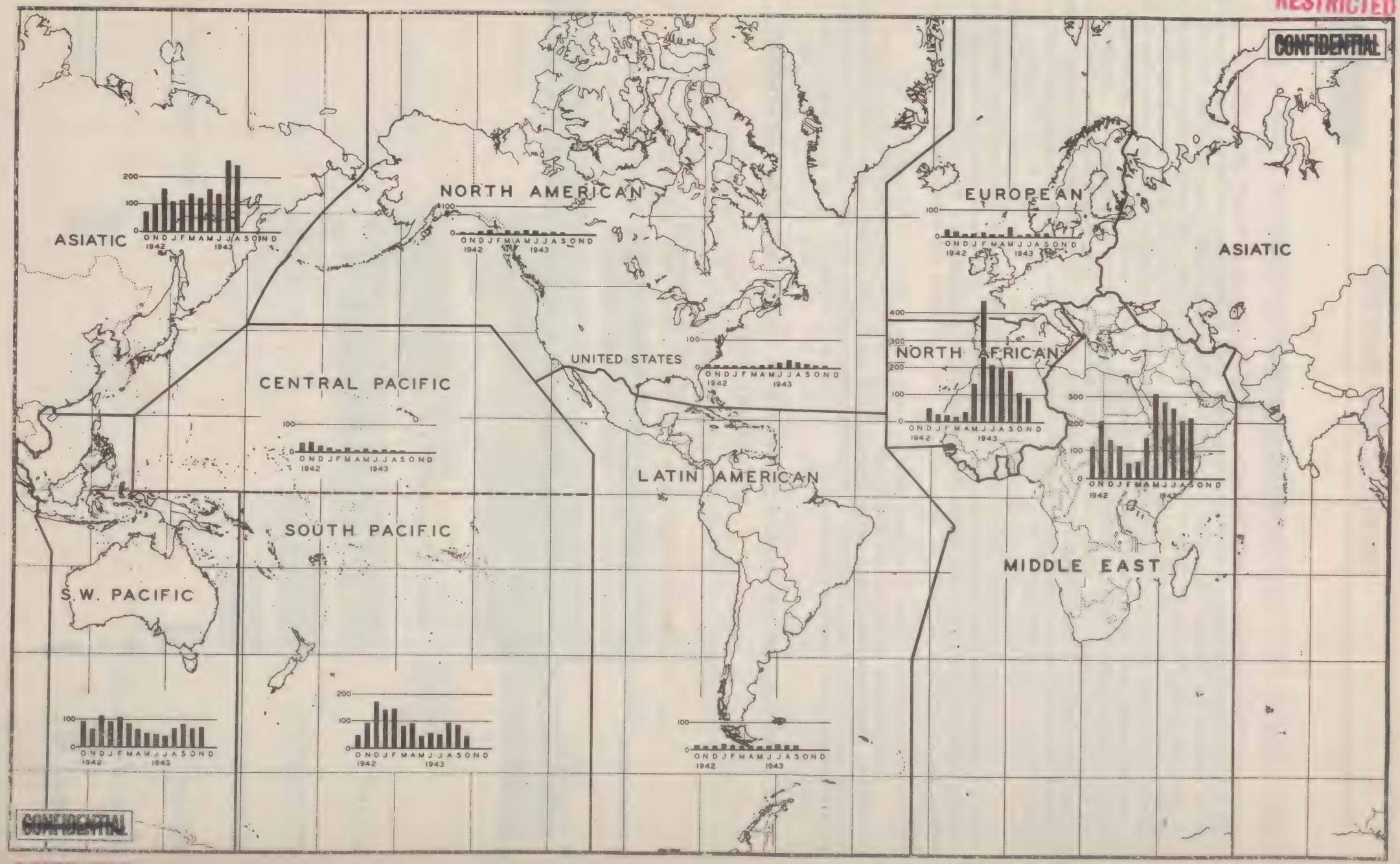


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## DISEASE HAZARDS IN AREAS ADJOINING CURRENT MILITARY OPERATIONS

At this time when so much thought is being given to future areas of military operations, it is well to consider some of the disease hazards that will be encountered in areas adjoining thoses where combat is now going on.

China, Burma, and India. This entire area, involving Burma, Thailand, the Malay States, French Indo-China and Southern China, is one of the most disease-ridden areas of the world. Malaria is the outstanding health problem and occurs in a malignant form. Few spots other than those of high elevation are free of the risk of malaria. Gastro-enteric infections, including typhoid fever and all forms of dysentery, are widespread. Cholera is endemic and periodically appears in explosive epidemics. Plague occurs periodically and might be encountered at any time. Typhus has been reported; a mite-borne form comparable to that encountered in New Guinea probably occurs, as does also the louse-borne, epidemic form. Filariasis is widespread, and both sandfly fever and dengue occur periodically.

Netherlands East Indies. Here also, malaria is the major health hazard, this being one of the most malarious sections of the world. Although considerable progress had been made in reducing malaria before the Japanese occupation, there is reason to believe that many of the control measures have been allowed to lapse. The mosquitoes involved vary considerably from island to island but in general are such as breed in open sunlight and in stagnant water. Frequently, clearing of the land results in explosive outbreaks of malaria unless control measures are taken. Plague and cholera had been brought under control prior to the war except for a rare case of the former on several of the islands and a few cases of the latter on the island of Celebes. Gastrointestinal diseases are widespread and a mite-borne typhus is probably to be encountered in the western half of New Guinea, in Sumatra and Java.

Japanese Mandated Islands. These islands are, so far as is known, free from malaria and cholera. There are obscure references to a "Marshall Island Typhus", the extent and identity of which are not clear. If it is truly typhus, it is presumably of the mite-borne variety. There is a moderate amount of dysentery and a slight amount of filariasis. Fungus infections are fairly common on these islands as elsewhere throughout the tropics.

Northwestern Europe. In general the health hazards of this area are comparable to those of the northern part of the United States, though a few exceptions are worthy of note. That section of Holland lying between Rotterdam and Amsterdam is an endemic focus of malaria, which is transmitted during the latter half of the year, extending up to January, though the individual infected at this time does not show the symptoms until the following spring. Diphtheria is at present rampant throughout Holland and Norway. Although precise data are lacking, it is probable that the situation in Belgium is comparable to that in Holland and the situation in Northern France and Germany has been slightly more favorable. The incidence in Denmark up to the current year was about the same as before the war. Troops going into this area would encounter an incidence of diphtheria such as has not been seen in the United States for several decades. Typhus unquestionably exists in Western Europe but it has not yet become widespread. On the other hand, the degree of louse infestation of both Holland and Norway has increased so sharply as to set the stage for an outbreak of typhus at any time. The northern part of Norway presents a serious problem from the standpoint of flies and mosquitoes which, although pests, cause no actual disease.

Northern Italy. The already occupied portion of Italy is the most malarious. There is malaria, however, in the area above Rome, especially in certain parts of the Po Valley. The incidence of dysenteries is higher than in northern Europe. Dengue fever appears periodically. Although typhus has not been a problem in the past, it may well become so at any time.

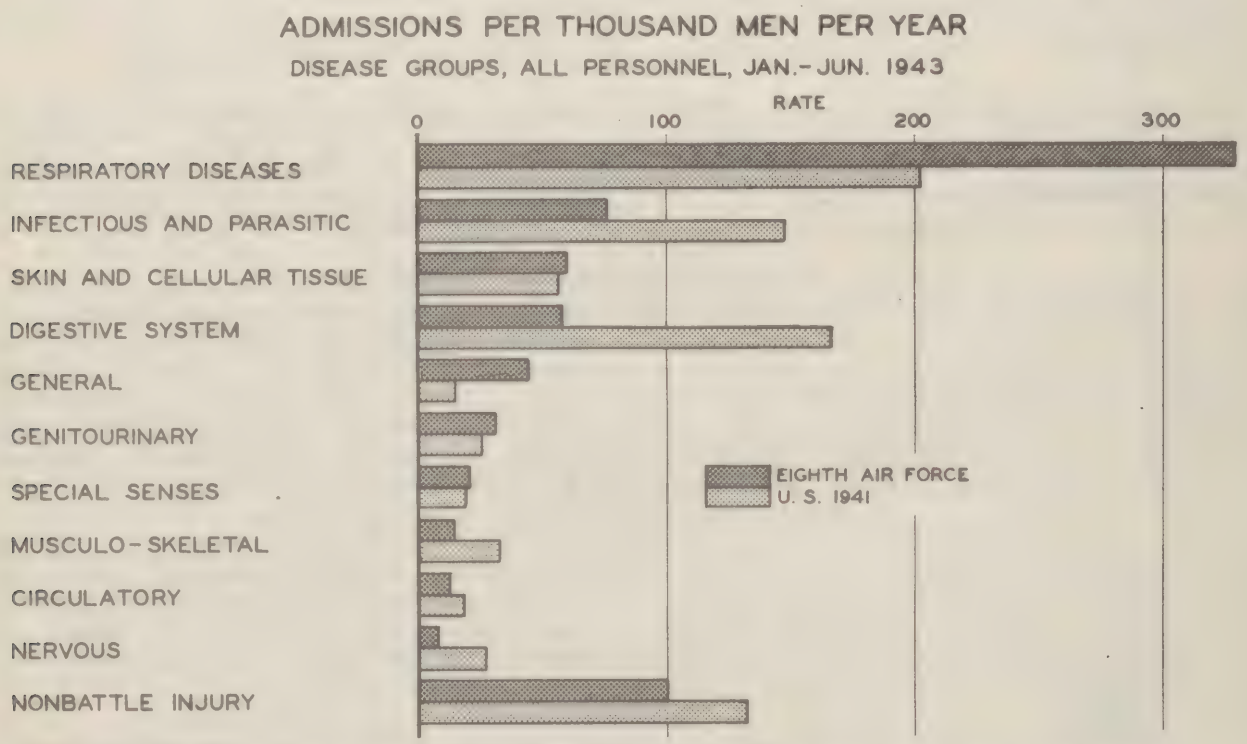
The Balkans. This area is the most dangerous in Europe from the standpoint of disease. Malaria is very prevalent and in the last war it succeeded in immobilizing both armies. The highest incidence of malaria is to be found in Macedonia and Thrace, although a very high rate will be found all along the Albanian and Yugoslavian coast extending upward into the hills and throughout the river valleys of Rumania and Bulgaria as well as other parts of Greece. The mosquitoes involved in these areas breed both in stagnant brackish water and in running streams, and are to be found both along the coast and in the hills. Typhus has been rampant in the Balkans on many occasions. During the winter 1942-43 there was a high incidence in some parts of the Balkans and there are indications of a great deal of typhus in this area during the coming winter. A rather malignant form of scarlet fever has prevailed in the Balkans for the past fifteen years. Dysenteries are much more common than in northern Europe.

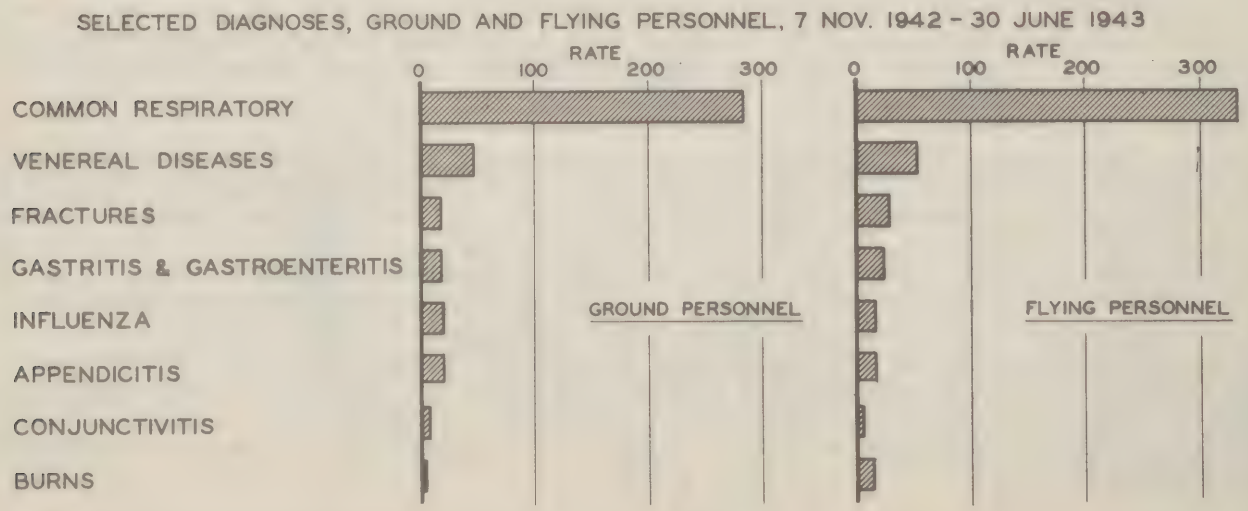
HEALTH OF THE EIGHTH AIR FORCE, BRITISH ISLES

A comprehensive report by the surgeon of the 8th Air Force describes the health problems of ground and flying personnel during the period 1 July 1942 through 30 June 1943. A summary of certain points of special interest follows.

In the first chart below the admission rates of the 8th Air Force for the period 1 January 1943 to 30 June 1943 are compared with similar rates for all troops in the Continental U. S. during 1941, the latest period for which rates are available according to the classification employed in the 8th Air Force report. The data are not too closely comparable for a number of reasons, notably the length of time covered in each case and the selection of men for overseas duty. Restriction of the 8th Air Force experience to the first half of the year tends to exaggerate the respiratory rate and perhaps also to minimize the rate for infectious and parasitic diseases and for those of the digestive system. The general impression remains, however, that the experience of the 8th Air Force has been rather favorable during the first half of 1943, with the possible exception of respiratory disease which was quite prevalent in the British Isles during the past winter season.

A comparison between flying personnel and ground personnel is made in the second chart below, only selected diagnoses being included. The general pattern of the rates is essentially the same, but flying personnel evidently were at some disadvantage with respect to the likelihood of common respiratory disease, fractures, and burns.



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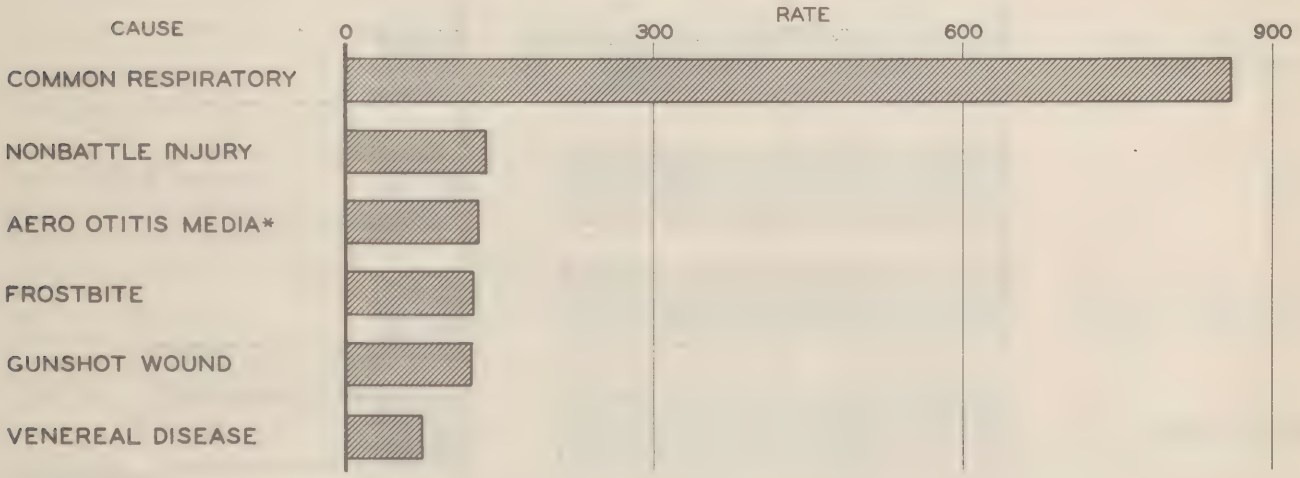
HEALTH OF THE EIGHTH AIR FORCE, BRITISH ISLES (Continued)

The importance of minimizing morbidity and mortality among flying personnel has led to the use of a health index slightly different from the usual admission rate and giving, for any cause, the rate at which men were removed from flying status for this cause during a period of one year. The top panel of the accompanying chart arrays the leading causes of removal from flying status according to their relative importance. For some causes, men would remain unfit for flying duty for a longer time than for others, so that the analogous "noneffective" rates might be arranged in a different order. The observations are heavily weighted by the recent winter experience.

Another statistic of special value in assessing the relative importance of various factors causing a loss of manpower is the air mission casualty rate. This shows, per 100 men dispatched on the operational missions of a stated period, the number of men killed, missing, or wounded in action. The bottom chart below gives the air mission casualty rate by months from August 1942 through June 1943. Among 75,122 combat crew members dispatched on operational missions 3,928 casualties were reported, or 5.2 percent per mission. The inset chart gives the percent associated with each of the three components of the total rate for the period. During 1942 the casualty rate reflects chiefly operational training and preparatory missions, bombing of submarine bases and coastal installations, and routine patrol flights. The generally higher casualty rate after the Casablanca conference reflects in part, at least, the greater hazards to which men and planes were exposed during daylight bombing of more distant targets.

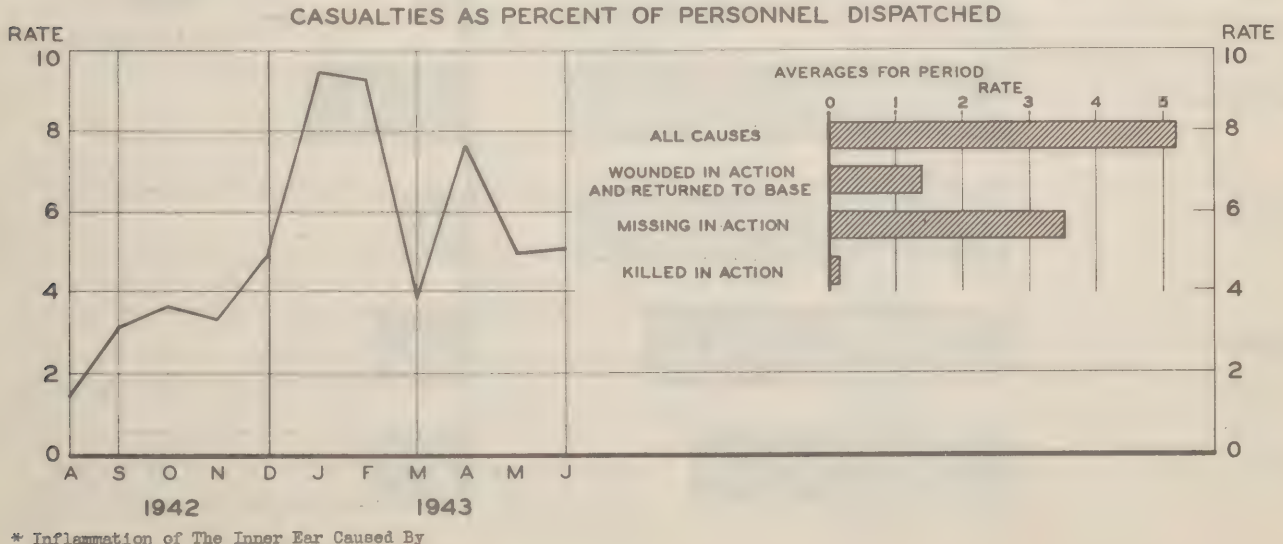
PERSONNEL REMOVED FROM FLYING DUTY, 7 NOVEMBER 1942–30 JUNE 1943

RATES PER THOUSAND MEN PER YEAR




AIR MISSION CASUALTY RATES, AUGUST 1942–JUNE 1943

CASUALTIES AS PERCENT OF PERSONNEL DISPATCHED




* Inflammation of The Inner Ear Caused By Air Pressure Changes While Flying.

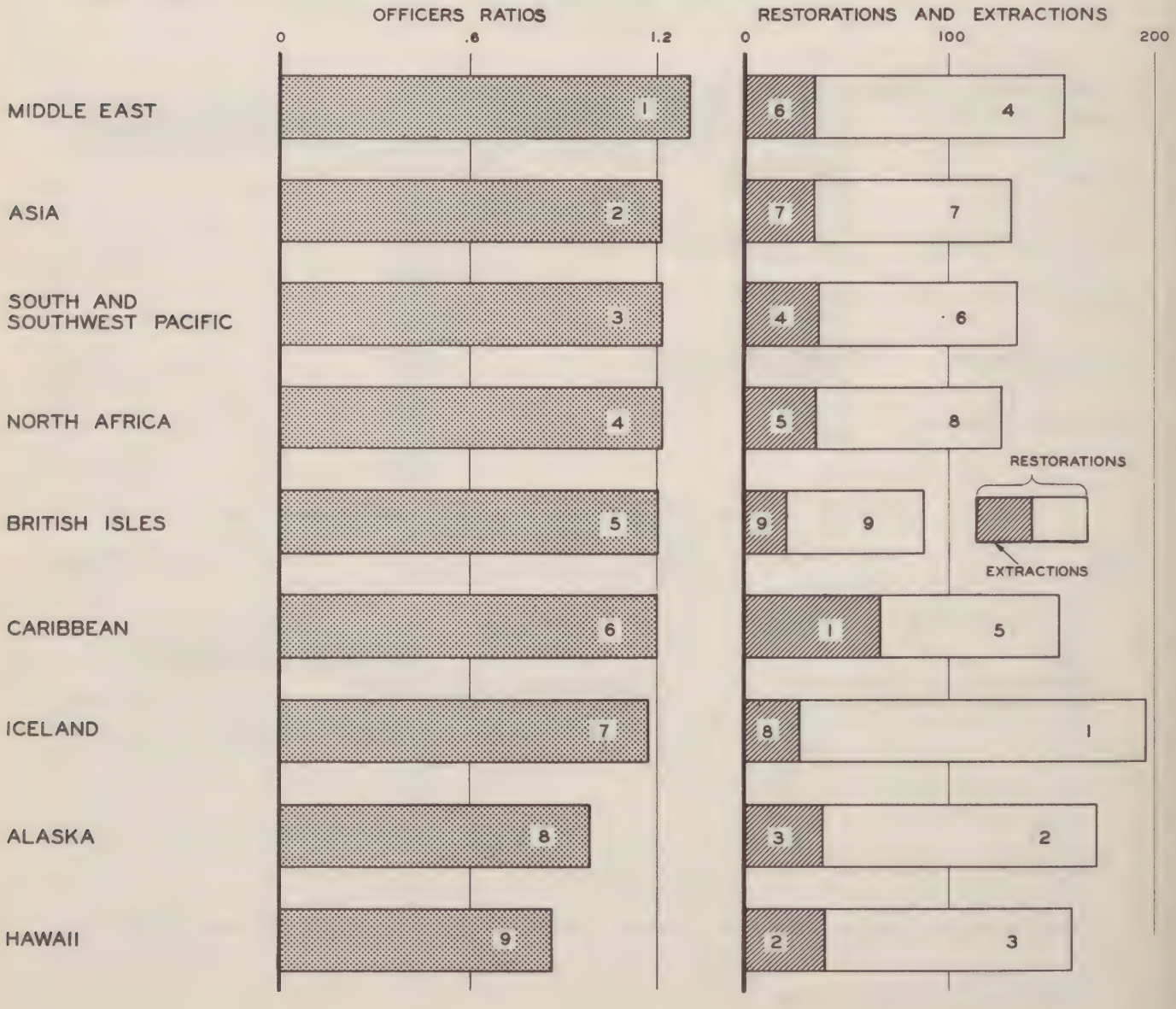
DENTAL TREATMENT OVERSEAS

During the period July through September the ratio of dental officers to total strength was virtually the same for all overseas areas except Alaska and Hawaii, where the ratios were slightly under 1 per 1,000 men. During World War I the ratio of dental officers per thousand strength never reached one, but there is now an average of about 1.2 per 1,000 men. The first chart below ranks the major overseas commands according to the average ratio for the three-month period.

Apart from special circumstances associated with the activity of the theater, its climate, the training program, availability of supplies, and the geographical distribution of troops in relation to dental officers, the ranking for any particular dental accomplishment should be approximately the same as that for the officer ratio. The right-hand panel of the chart below presents the number of restorations and extractions per 1,000 men per month during the period. The average extraction rate for all overseas troops was 37 per 1,000 men per month, but the theater rates ranged from 20 for the British Isles to 65 for the Caribbean. The numbers set in the bars denote the ranking of the various theaters with respect to the rates of restoration and extraction.

DENTAL OFFICERS PER THOUSAND MEN AND DENTAL TREATMENTS PER THOUSAND MEN PER MONTH

OVERSEAS COMMANDS, JULY-SEPTEMBER 1943



DENTAL TREATMENT OVERSEAS (Continued)

The average restoration rate was about 150 per 1,000 men per month for all overseas forces during the period. Iceland, which has consistently reported a high restoration rate, had the highest with 196 per 1,000 men per month. The rate of 88 for the British Isles was the lowest of all the rates for the period.

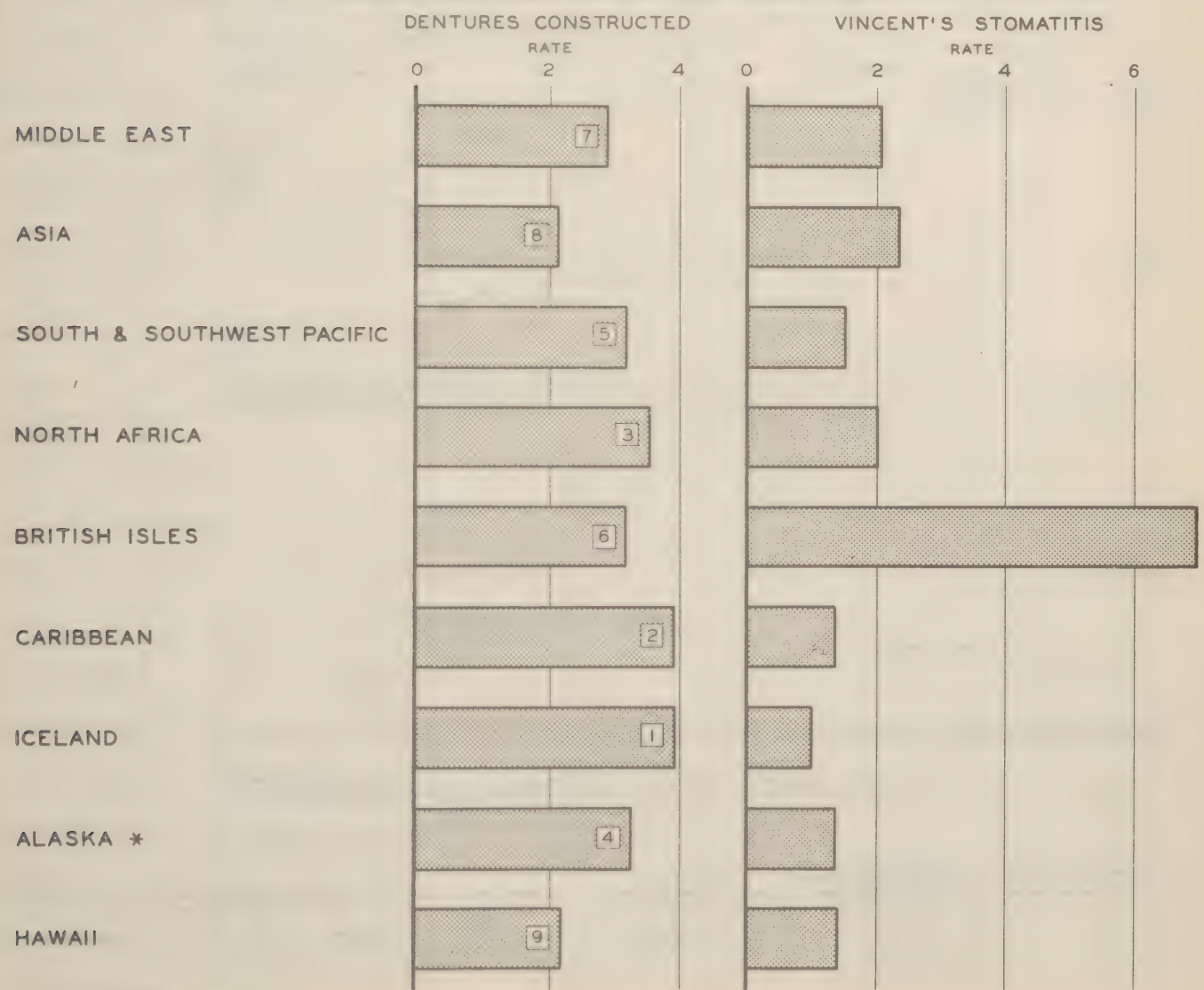
The frequency of denture construction in each command is shown in the left-hand panel below, the order being that of the previous page and the numerals at the side giving the ranking with respect to denture construction. The average rate for all overseas forces was 3.5 dentures per 1,000 men per month. Iceland was high with 4.0, and Asia and Hawaii were low with 2.1 dentures per 1,000 men per month. In the preceding three months Hawaii averaged nearly 7 dentures per 1,000 men per month. It is believed, therefore, that the lower rate is indicative of marked progress made in the direction of completing the dentures required for the troops in this area.

Except in the British Isles, the average incidence of Vincent's Stomatitis has been highly favorable both in the U. S. and overseas. Although the rate of 7 for this command during July, August, and September is considerably higher than the overseas average of 2.7 admissions per 1,000 men per month, there has been a considerable improvement since April when the British Isles rate was about 11 per 1,000 men per month. Iceland reported the lowest rate of admission for this important infectious disease.

DENTURE CONSTRUCTION AND INCIDENCE OF VINCENT'S STOMATITIS

PER THOUSAND MEN PER MONTH

OVERSEAS COMMANDS, JULY - SEPTEMBER 1943




* July and August only

# DISEASE AND INJURY



## VENEREAL DISEASE

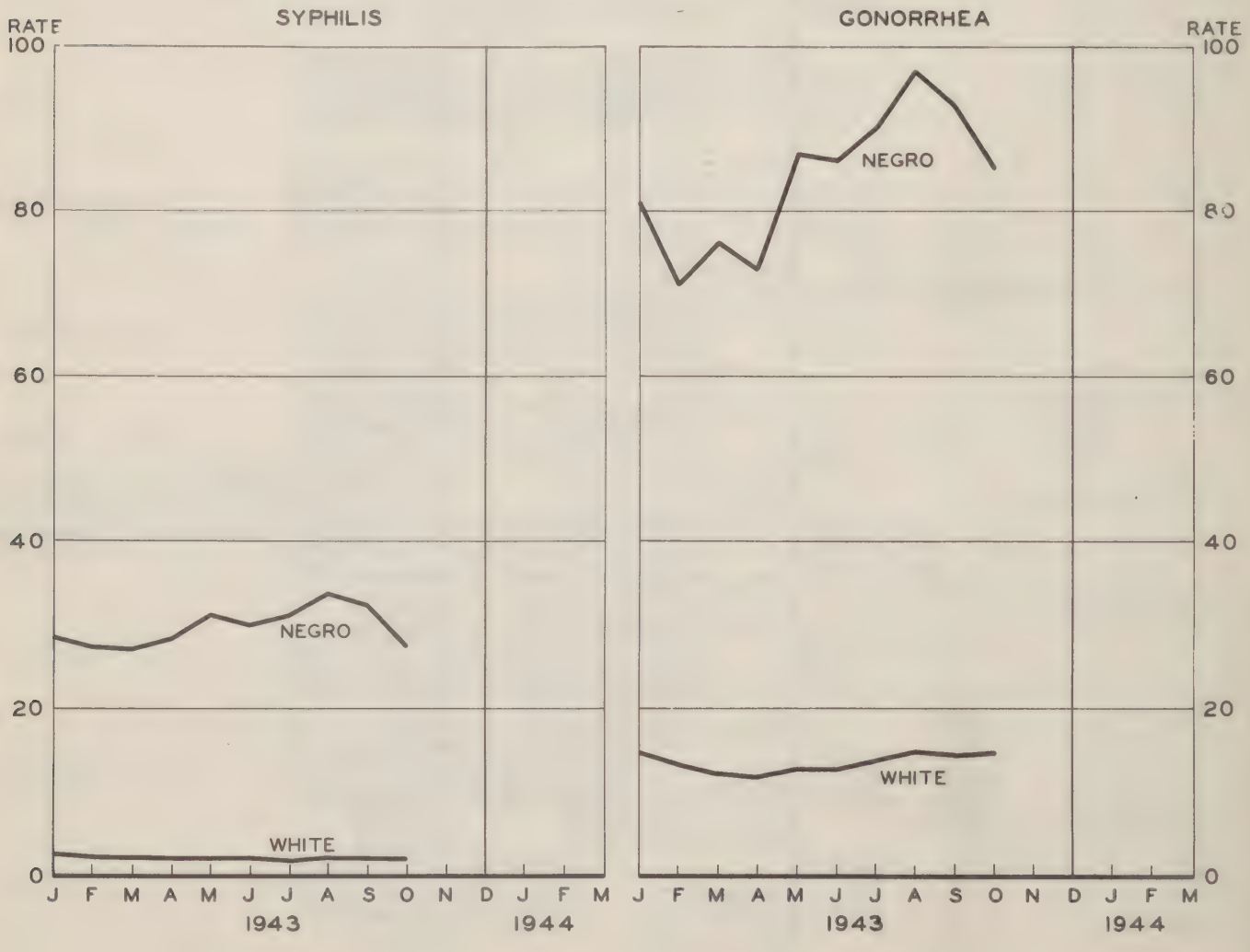
Reduction of the disproportionately high rate of venereal infection among Negro troops is one of the major problems of the Army Venereal Disease Control Program. Although Negroes comprise a relatively small proportion of the total strength their rates, which have at times been as much as 10 times those for white troops, are so high that they influence markedly the average venereal rate for all Army troops.

The admission rates for gonorrhea and syphilis among troops stationed in the Continental U. S. are given in the first chart below. They show how little change there has been in the admission rate for whites, and how important the changes are in the rates for Negro troops. After a generally upward trend from April to August, the gonorrhea rate for Negro troops declined sharply in September and October. The syphilis rate for Negroes also declined in this period. Excluded are the rates for chancroid and other venereal diseases.

At the direction of The Surgeon General, a conference was held in Washington in October 1943 to study the problems of venereal disease control among Negro troops and to review the methods employed by certain units in which Negro venereal disease incidence has been below the Army average. The recommendations of the conference were: improvement of recreational facilities for Negro troops; better adaptation of venereal disease education to the needs of Negro troops; more extensive use of both commissioned and non-commissioned Negro personnel in the program; and increased use of prophylaxis facilities. Considerable importance was attached to the last group of recommendations because of the greater risk of exposure on the part of the colored soldier, reflecting as it does the greater incidence of venereal disease among the colored civilian population with whom the soldiers come in contact.

VENEREAL DISEASE, ADMISSIONS PER THOUSAND MEN PER YEAR, BY COLOR

ARMY IN THE CONTINENTAL U.S.



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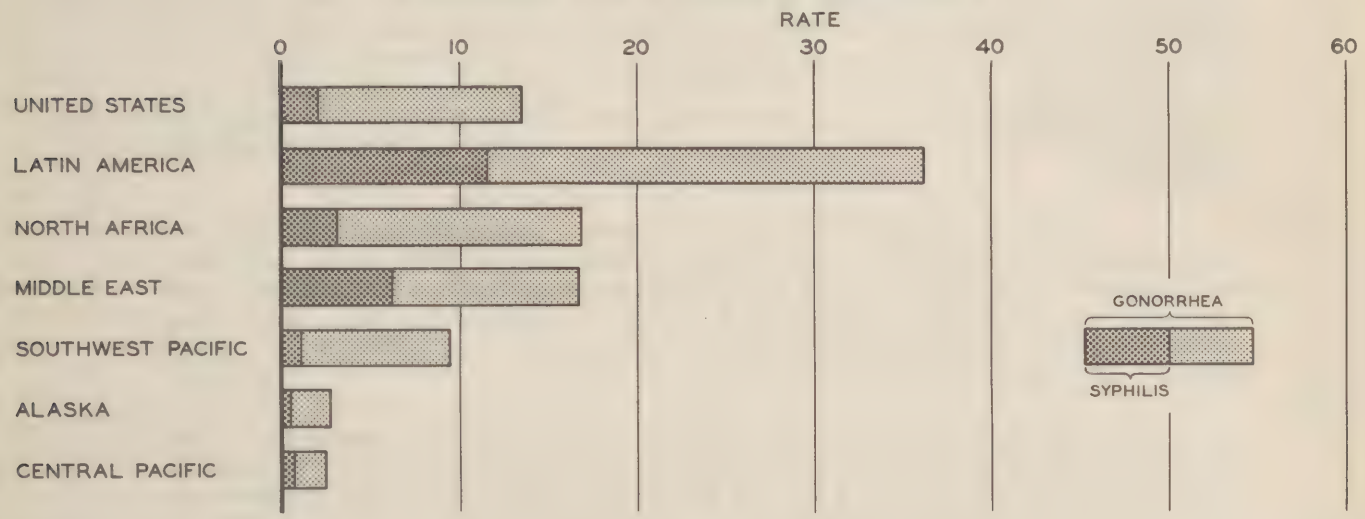
VENEREAL DISEASE (Continued)

The significance of color is especially important when theater rates are compared, because the ratio of Negro to white strength may vary. The most meaningful comparisons are those specific to each color group. For this reason the available data giving a color breakdown for overseas theaters are shown below. The first chart compares the various theaters with respect to gonorrhea and syphilis rates for whites. The second chart compares whites and Negroes as to total venereal disease rates. Although the admission rates in Latin America are exceptionally high for whites, they are relatively favorable for Negroes. The admission rate for Puerto Rican troops is also lower than might be expected, about 52 per 1,000 strength per year for all venereal diseases. The Caribbean program for the control of venereal disease appears to have been relatively more successful among the Puerto Rican and the Negro troops than among white troops from the Continental U. S.

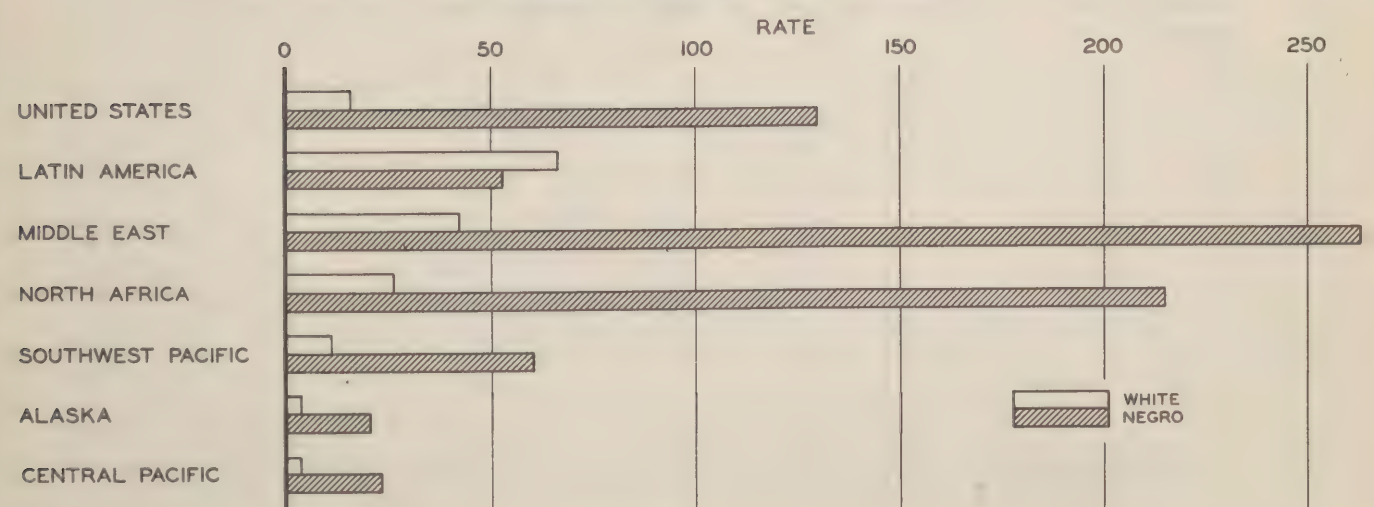
VENEREAL DISEASE, ADMISSIONS PER THOUSAND MEN PER YEAR
OVERSEAS COMMANDS, JANUARY - SEPTEMBER 1943

GONORRHEA AND SYPHILIS, WHITE TROOPS




OVERSEAS COMMANDS SHOWN

ALL VENEREAL DISEASE, BY COLOR

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DIPHTHERIA

Diphtheria is not ordinarily a disease of military importance because most cases occur in children under ten years of age. In recent years, however, changes have been observed in the reported age incidence. In a severe outbreak in Halifax, N. S., for example, the attack rate was fairly uniform at all ages under 25, after which it declined. This shift to an older group is thought to result in part from the fact that an increasing proportion of children are immunized with diphtheria toxoid in their pre-school years and later lose some of their immunity. The greatly reduced prevalence of diphtheria also tends to equalize exposure on the part of the various age-groups.

The disease is found in all parts of the world. It has a distinct seasonal rise and fall and in the northern hemisphere tends to reach its peak in November.

Diphtheria has not heretofore been a problem in the U. S. Army. This year, for example, through 27 November, only 83 cases had been reported among U. S. troops stationed in the Continental U. S. In certain overseas theaters, notably the Middle East and South Pacific, its prevalence among U. S. Army troops has been considerably higher, and British troops in North Africa have had a fair amount of trouble both with ordinary diphtheria of the throat and with diphtheritic ulcers of the skin. As yet, however, there is nothing alarming about the reported incidence.

The disease has been quite common among German prisoners of war recently brought to this country, but most of the cases have been mild in form. Diphtheria has not occurred among Italian prisoners. The rate of admission for the German P. O. W. population has been many times that for U. S. troops, whether at home or abroad. Immunization of large groups of prisoners is under way.

Medical intelligence reports speak of great increases in the prevalence of diphtheria on the continent of Europe since the outbreak of war. Although the evidence is not entirely trustworthy, the increase is believed to have been more marked in the Reich and the occupied countries (except Denmark) than in other countries such as Sweden.

Diphtheria is one of the diseases most effectively prevented by artificial immunization, although it is not so simple a matter for adults as it is for children. At the outset of the mobilization diphtheria toxoid was considered for inclusion in the immunization program, but the special difficulties involved in immunizing adults and the rarity of the disease outweighed any gains which appeared likely at that time. The advisability of immunizing certain overseas forces is currently under consideration and surveys will be made to estimate the proportion of susceptible men. Different methods of immunizing adults will also be evaluated.

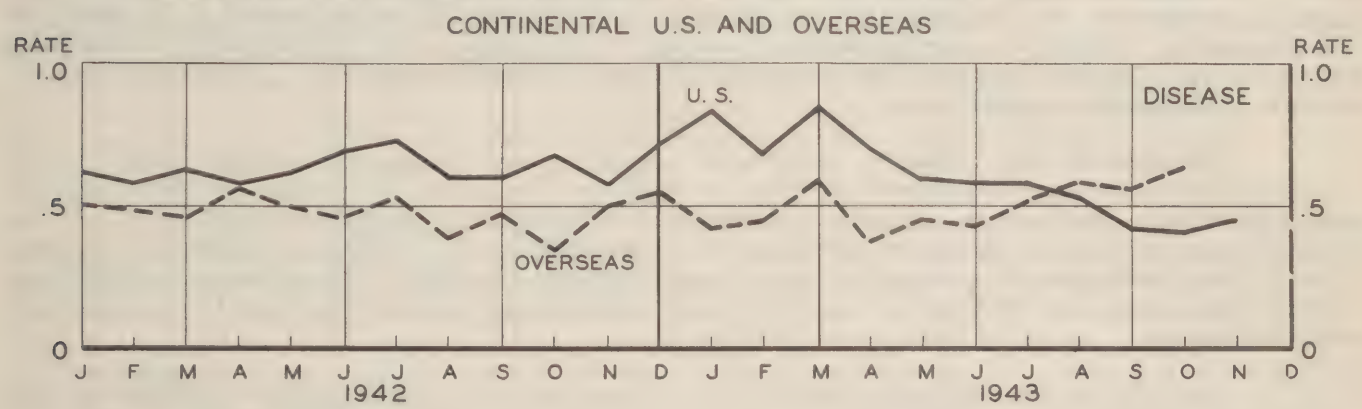
MORTALITY FROM NONBATTLE CAUSES

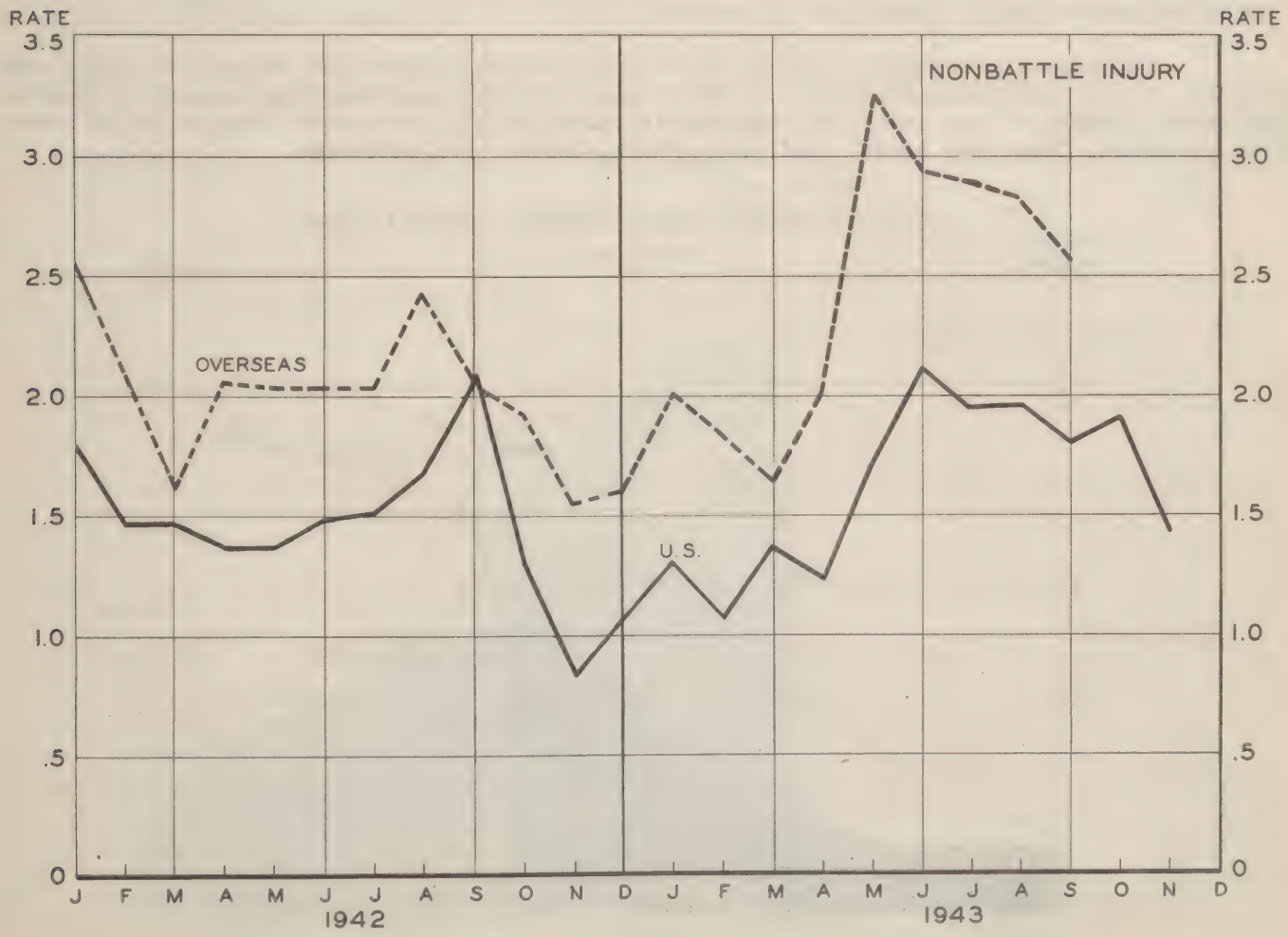
For the third consecutive month the death rate from disease among troops in the Continental U. S. remained below .50 deaths per thousand men per year. These rates are lower than any which prevailed during 1942. At the same time the death rate from disease overseas has been rising slowly until it now exceeds that for the Continental U. S.

The provisional death rate from nonbattle injury declined sharply during November for troops in the Continental U. S., and there was also a marked drop in the average overseas rate for October, according to preliminary radio reports. If aircraft deaths among A.A.F. personnel are removed from the U. S. rate of 1.4 for November it declines to .6. For September and October the comparable rates were 0.7, and 0.9 deaths per thousand men per year. The rates for reported aircraft deaths to A.A.F. personnel are 3.6, 3.3, and 3.1 when taken in relation to A.A.F. strength, and 1.1, 1.1, and .8 when computed on the basis of total U. S. Army strength in the Continental U. S. during the last three months.

DEATHS PER THOUSAND MEN PER YEAR, NONBATTLE CAUSES

CONTINENTAL U.S. AND OVERSEAS



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## UTILIZATION OF AND REQUIREMENTS FOR BEDS IN NAMED GENERAL HOSPITALS

The requirements for beds in general hospitals are calculated at one percent of total Army strength plus 0.7 percent of the troops overseas. The estimated needs for the period January 1942 to December 1944 are shown in the chart below. The line of projected availability reflects construction and conversion in progress, and is revised as estimated dates of occupancy become available for new facilities. Attainment of the present schedule would provide about 98,000 beds by the end of June, 1944, or 92 percent of the requirement for that date.

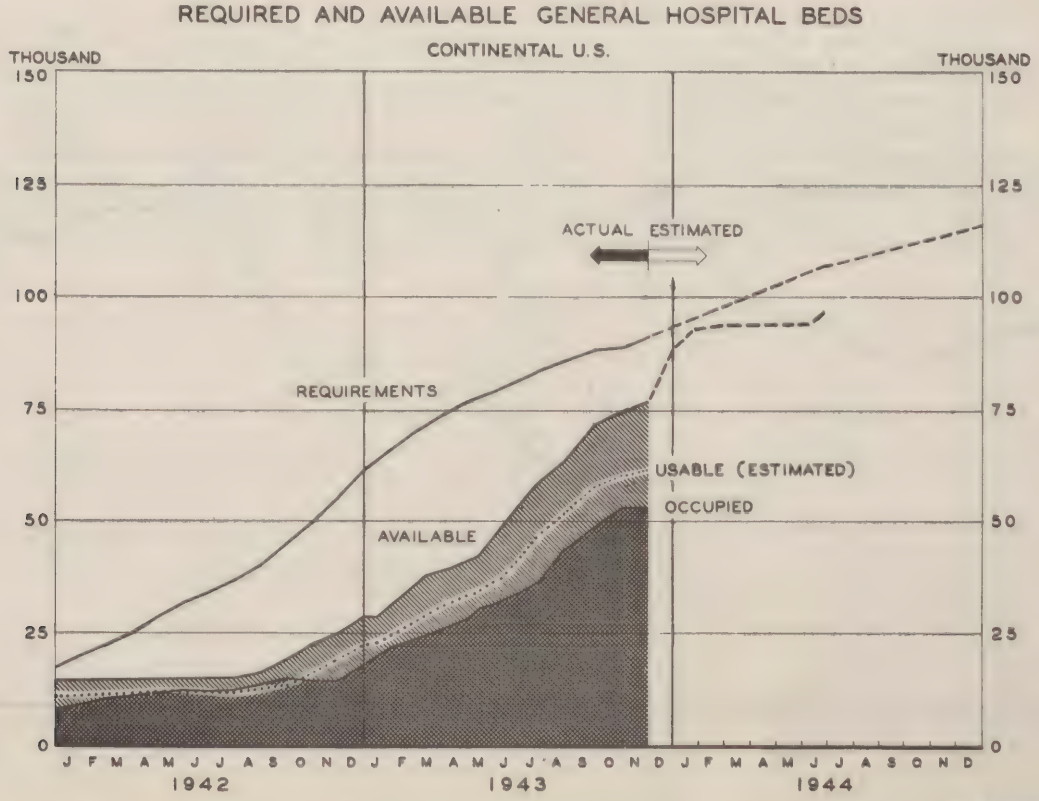
The anticipated needs for beds in general hospitals have not yet completely developed because the Army has enjoyed excellent general health and especially because the flow of evacuees from overseas has not yet attained the proportions which planning has necessarily assumed. However, the occupancy figures have mounted very rapidly during 1943 and there is no reason to believe that the calculated requirements for the future are too high. A margin of unoccupied beds represents an indispensable safety factor, whereas a deficit would justifiably open the War Department to censure by an informed public expecting unprecedented hospital facilities for Army personnel. In fact, the trend of utilization suggests that a very rapid approximation to the scheduled requirements for the future may be needed to accommodate the increasing numbers requiring hospitalization of this type. On 27 November, there were approximately 23,000 evacuees from overseas in named general hospitals. Of these about 17 percent were battle casualties.

The broken line close to the line of occupancy represents the average limit of normal utilization without overcrowding, since at any one time about 20 percent of the available beds cannot be used because of the importance of maintaining specialized wards, e. g. for women, surgical cases, patients suffering from contagious and infectious diseases, and the like. When more than 80 percent of the normal beds are occupied, the average hospital has found it necessary to crowd beds into corridors and solaria, or to place patients in expansion barracks.

The number of available normal beds in named general hospitals increased about two percent from 74,800 for 30 October to 76,500 for 27 November. The average number of beds occupied declined slightly from 70 to 69 percent.

Although all hospitals (except Mason, not counted against the authorized total) are included in the above counts and in the chart below, certain hospitals have ceased to operate as general hospitals and should be regarded as receiving and evacuation hospitals for overseas patients. These are Lovell, Halloran, Stark, Barnes, and Letterman.

REQUIRED AND AVAILABLE GENERAL HOSPITAL BEDS





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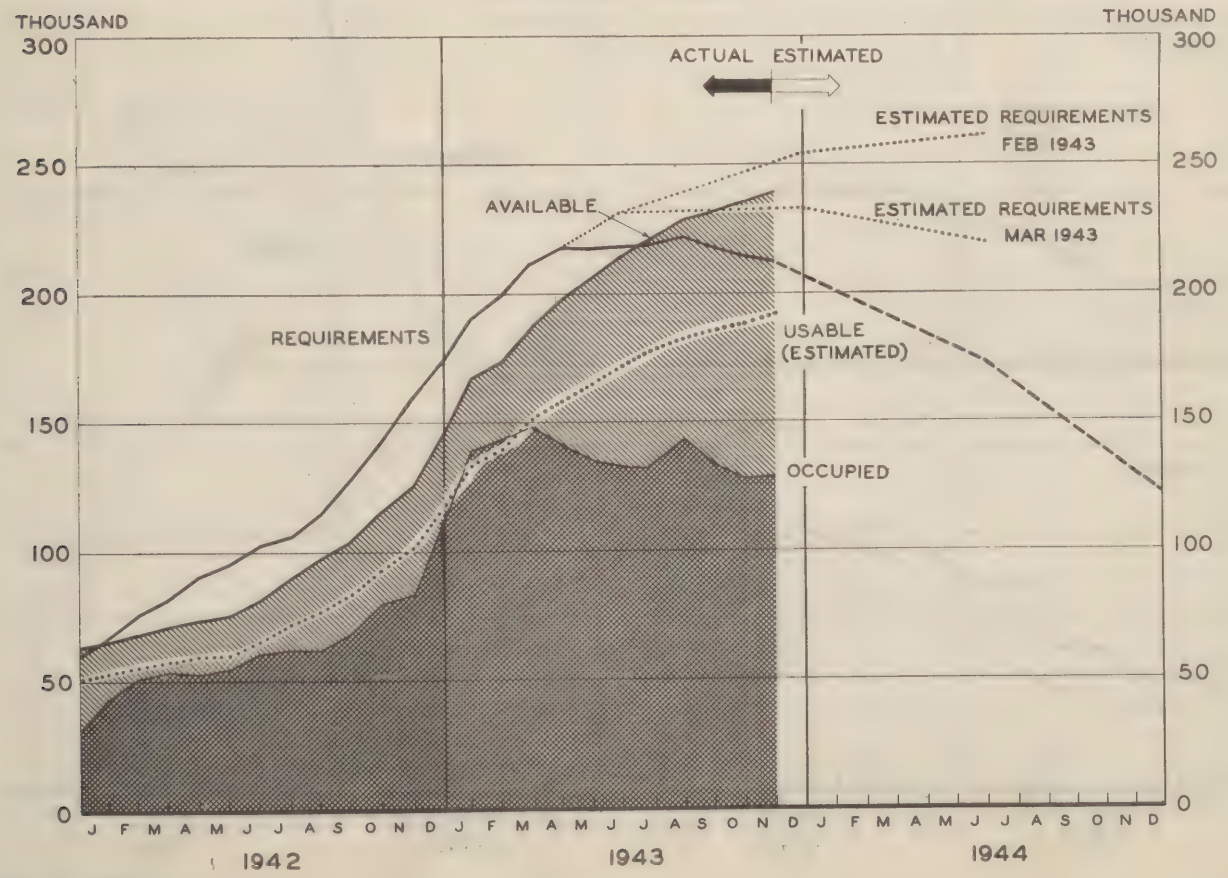
## UTILIZATION OF AND REQUIREMENTS FOR BEDS IN STATION HOSPITALS

The requirements for beds in station hospitals in the Continental U. S. are calculated on the basis of 4 percent of the strength of the troops to be stationed here, with an allowance for prisoners of war. The size of the P. O. W. population as of 30 November adds about 6,800 beds to the calculated requirement. The requirements computed from present-day strength, however, differ materially from those which furnished the objectives early in 1943, when the construction-planning stage was virtually completed. The top lightly dotted line is taken from HEALTH for February 1943. In March the requirements were lowered to those shown by the lower dotted line, from HEALTH for March 1943. Recent changes in projected strengths necessitate yet another revision downward, and the dashed line, the present projection of need, is slightly lower than that which it replaces. By the end of 1944, according to the most recent estimates, only 122,000 station hospital beds will be required.

In the face of the steady lowering of estimated requirements it is not surprising that there should now be an apparent surplus of station hospital beds. The original estimates having been approximately achieved, it now becomes essential to find alternative uses for some of the facilities already constructed. Some conversion to general hospitals is evidently in order, but such utilization requires the virtual abandonment of posts of some size, or sufficient reduction in the strength of large posts to release hospitals of adequate size, and may be hampered by small reductions in station complements which serve only to spread the surplus among hospitals. Studies are being made of present and prospective needs of individual stations with a view to recommending such action as will permit the most effective utilization of present facilities.

The other lines show the total number of occupied beds, the number of available normal beds, and the estimated number of usable normal beds (80 percent of the number of available normal beds), to indicate average utilization without overcrowding. The curves for available and occupied beds exclude those reported from the several maneuver areas, since they belong chiefly to numbered units. On this basis the number of normal beds available in station hospitals was 239,500 on 27 November, about two percent above the 234,800 reported for 30 October. The average number of beds occupied changed only slightly, from 55 to 54 percent of normal beds available. The requirements, of course, are based on the expected load during the winter season, and the sick rate has been remarkably low this fall.

REQUIRED AND AVAILABLE STATION HOSPITAL BEDS
CONTINENTAL U. S.



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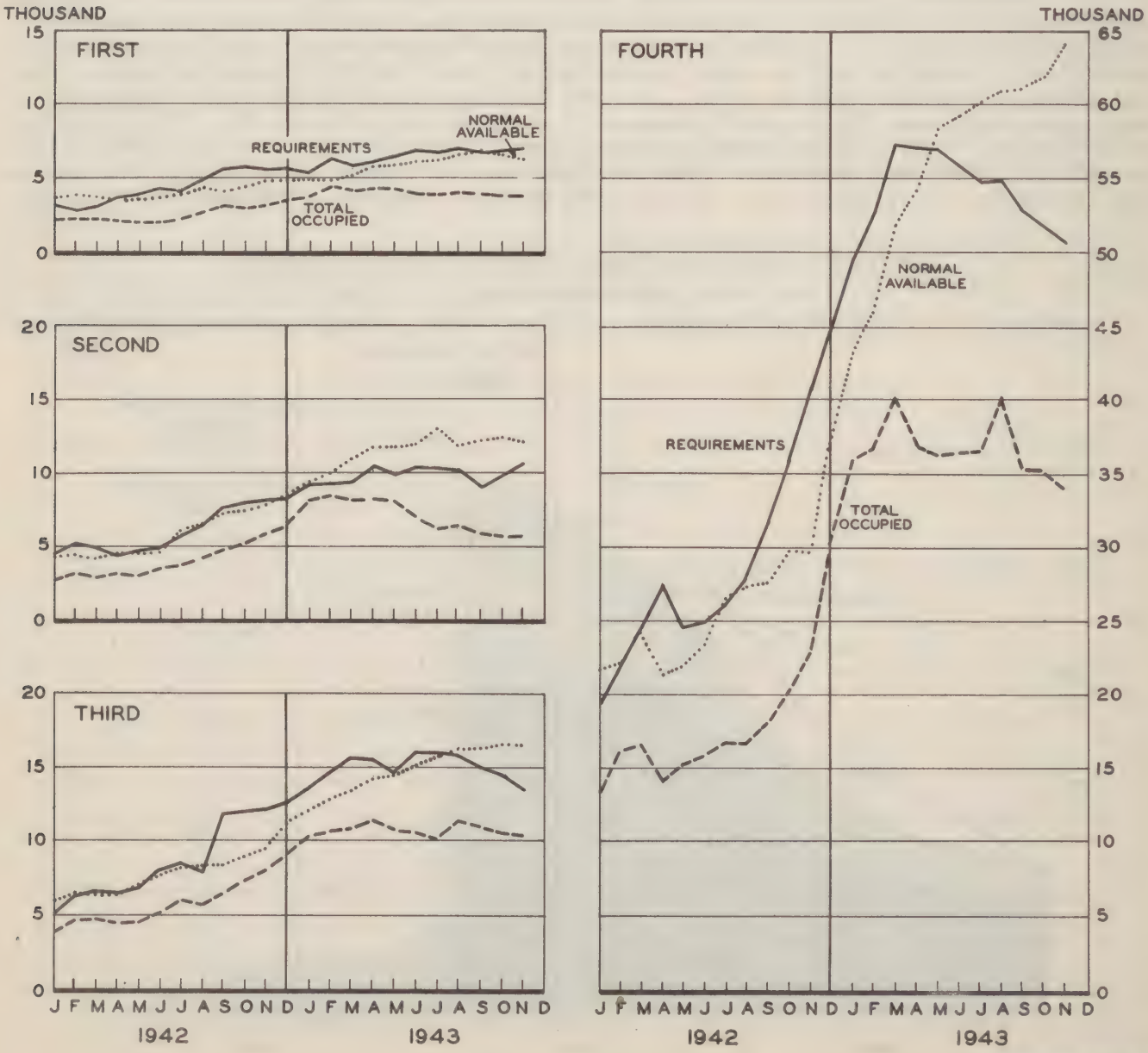
STATION HOSPITAL FACILITIES, SERVICE COMMANDS

Although the hospital construction program has proved to have been well conceived and executed in the light of the strength estimates of a year ago, now that the strength of the forces stationed in the Continental U. S. is declining there are developing apparent surpluses of beds (both AAF and ASF) in the service commands. Both the Army Air Forces and the Army Service Forces have for some months recognized the importance of the problem and steps are being taken to bring station hospital facilities in line with reduced strengths. In view of the critical shortage of medical personnel, especially doctors, it is essential that truly surplus hospital facilities not be allowed to consume even small numbers of skilled medical personnel.

The charts which follow detail the relationship between the requirements for and the availability and utilization of station hospital beds within the geographical limits of each service command. The requirements have been computed as 4 percent of the strengths reported by the A.G.O., which exclude troops in staging areas. The beds available and occupied exclude those reported from the maneuver areas, since most of the facilities there are believed to consist of numbered units. On this basis, the Fourth, Seventh, and Eighth Service Commands appear to have some excess of beds available.

## REQUIRED AND AVAILABLE BEDS IN STATION HOSPITALS
### BY SERVICE COMMAND



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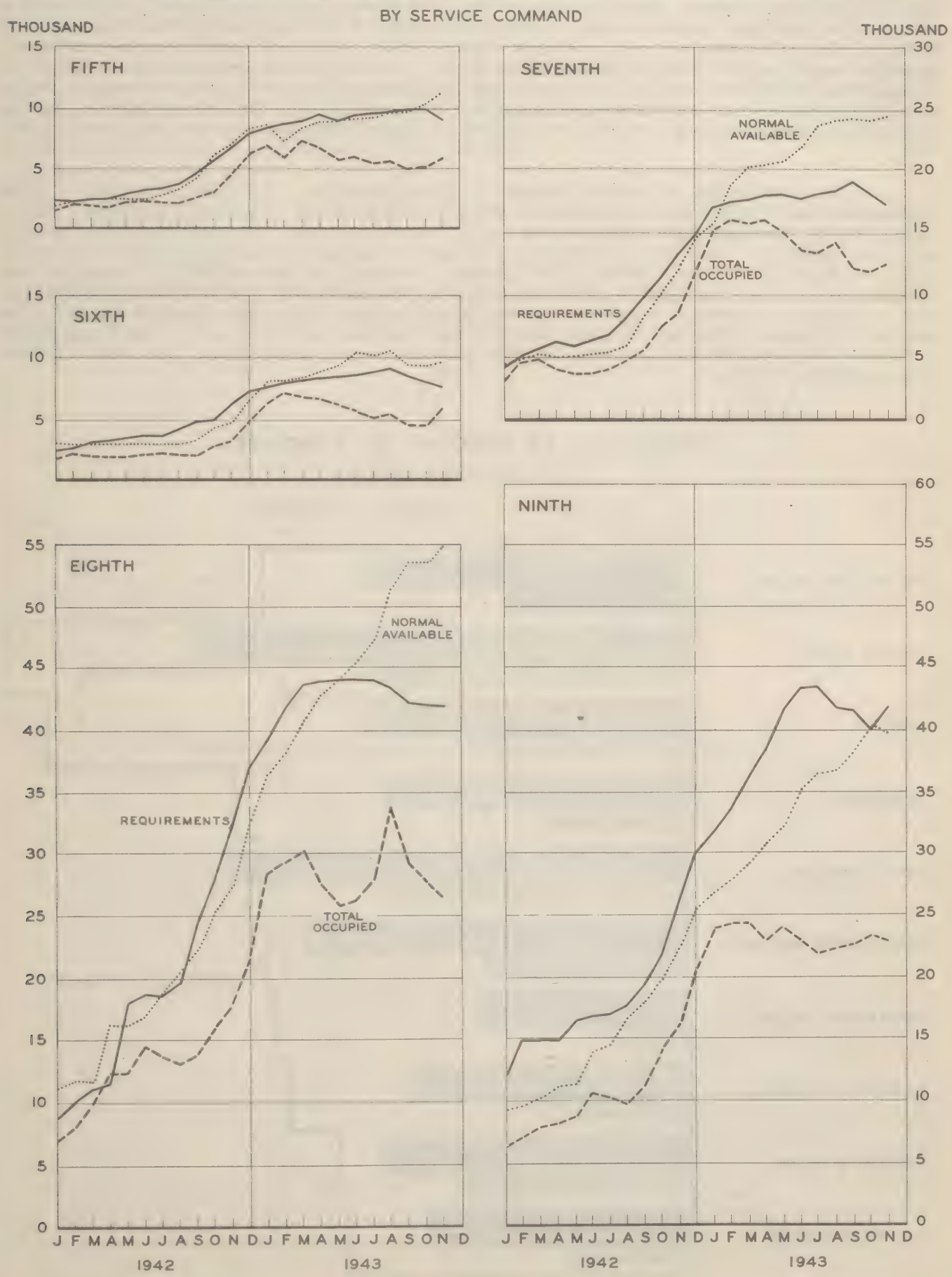
# HOSPITALIZATION



STATION HOSPITAL FACILITIES BY SERVICE COMMAND (Continued)

## REQUIRED AND AVAILABLE BEDS IN STATION HOSPITALS

BY SERVICE COMMAND



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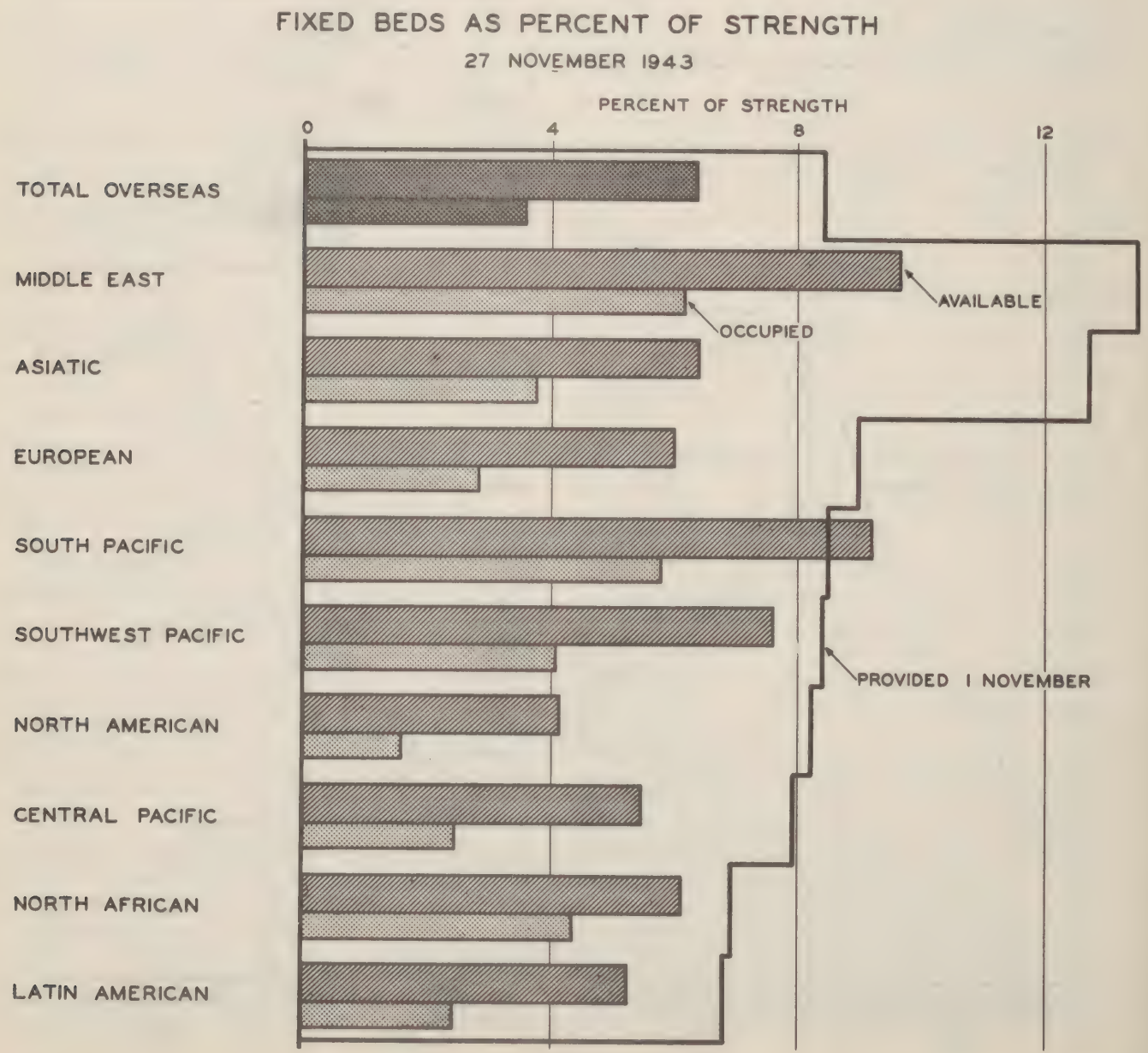
HOSPITALIZATION OVERSEAS

The accompanying chart shows, for each theater, and as a percentage of U. S. Army strength there: (1) the number of fixed beds provided up to 1 November 1943; (2) the number of fixed beds reported as ready for use on 27 November 1943; and (3) the total number of patients hospitalized in the theater on the latter date. Although mobile hospital units are provided with all tactical units, it is essential that sufficient fixed beds be provided to care for each patient requiring hospitalization. In comparison with the five percent of strength now provided in the U. S. for station plus general hospitals, some overseas theaters need 10 percent or more in fixed hospitals (station, general, and field hospitals). The estimated need varies among theaters in relation to combat activity and the incidence of disease.

In consequence of recent changes in troop strength, the relative amount of fixed hospitalization provided has declined for both the Asiatic and European theaters. Only a slight change in fixed beds provided for the Middle East raises its percentage above that of all other theaters. The term "provided" is used to include facilities earmarked for shipment, in transit, and in storage in the theater, as well as those actually ready for use. The needs of the Asiatic theater are influenced by the necessity for providing hospitalization in support of certain Chinese units which are excluded from the strength factor. The apparent discrepancy between the beds provided and reported ready for use in the South Pacific Theater may reflect the inclusion of beds in convalescent camps among the count of fixed beds available for use.



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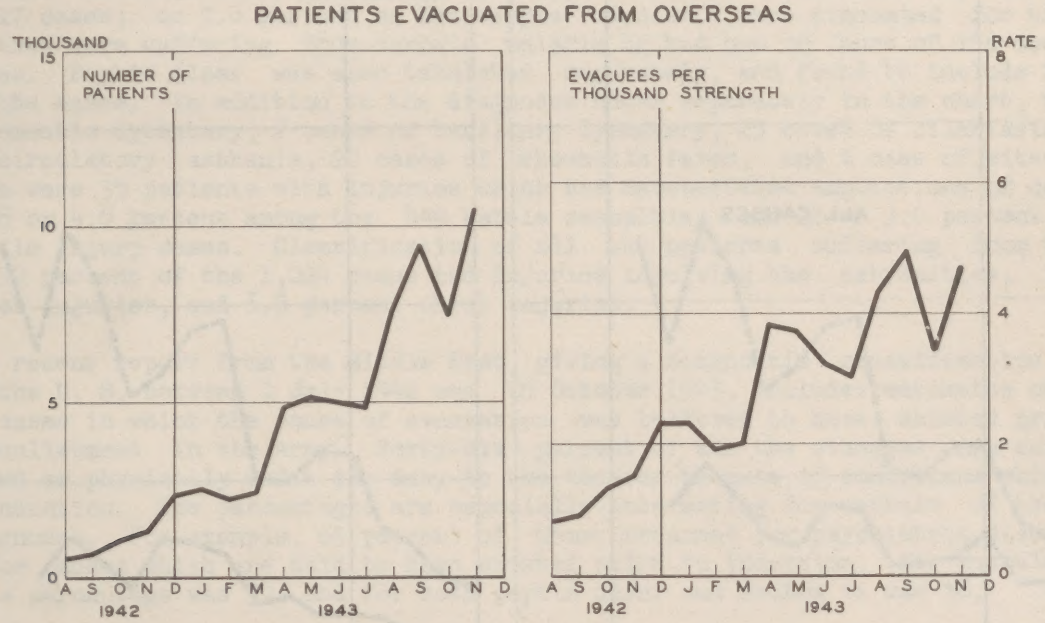
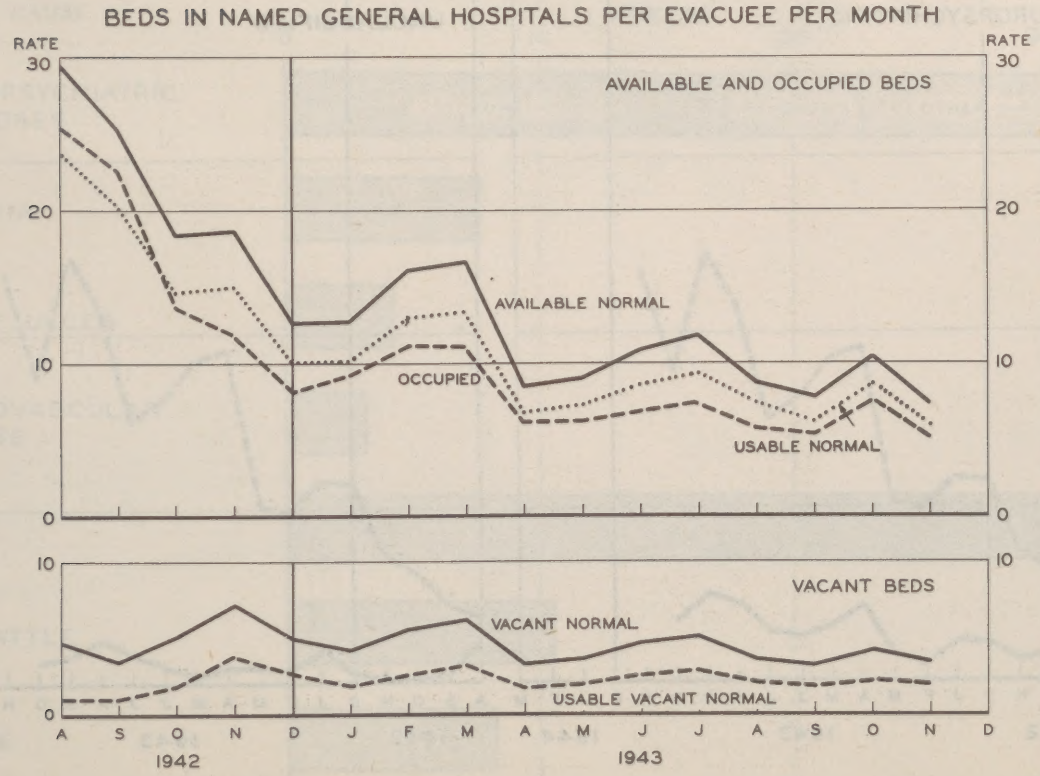
## EVACUATION OF PATIENTS FROM OVERSEAS

During November more patients were evacuated to the Zone of the Interior than in any previous month of the war. The provisional estimate of 10,500 corresponds to a rate of 4.7 per 1,000 overseas strength per month, which is next to the highest rate of evacuation yet recorded for any month. The experience to date is shown graphically below in both absolute and relative form. The lower set of panels shows the relationship between the number of evacuees received each month and the beds available in named general hospitals. Usable normal beds have been estimated by subtracting total beds occupied from the usable normal beds. Vacant usable (and normal) beds have been estimated by subtracting total beds occupied from the usable normal beds. Although hospital facilities expanded, the number of evacuees increased, and the number of beds per evacuee declined.

PATIENTS EVACUATED FROM OVERSEAS




BEDS IN NAMED GENERAL HOSPITALS PER EVACUEE PER MONTH



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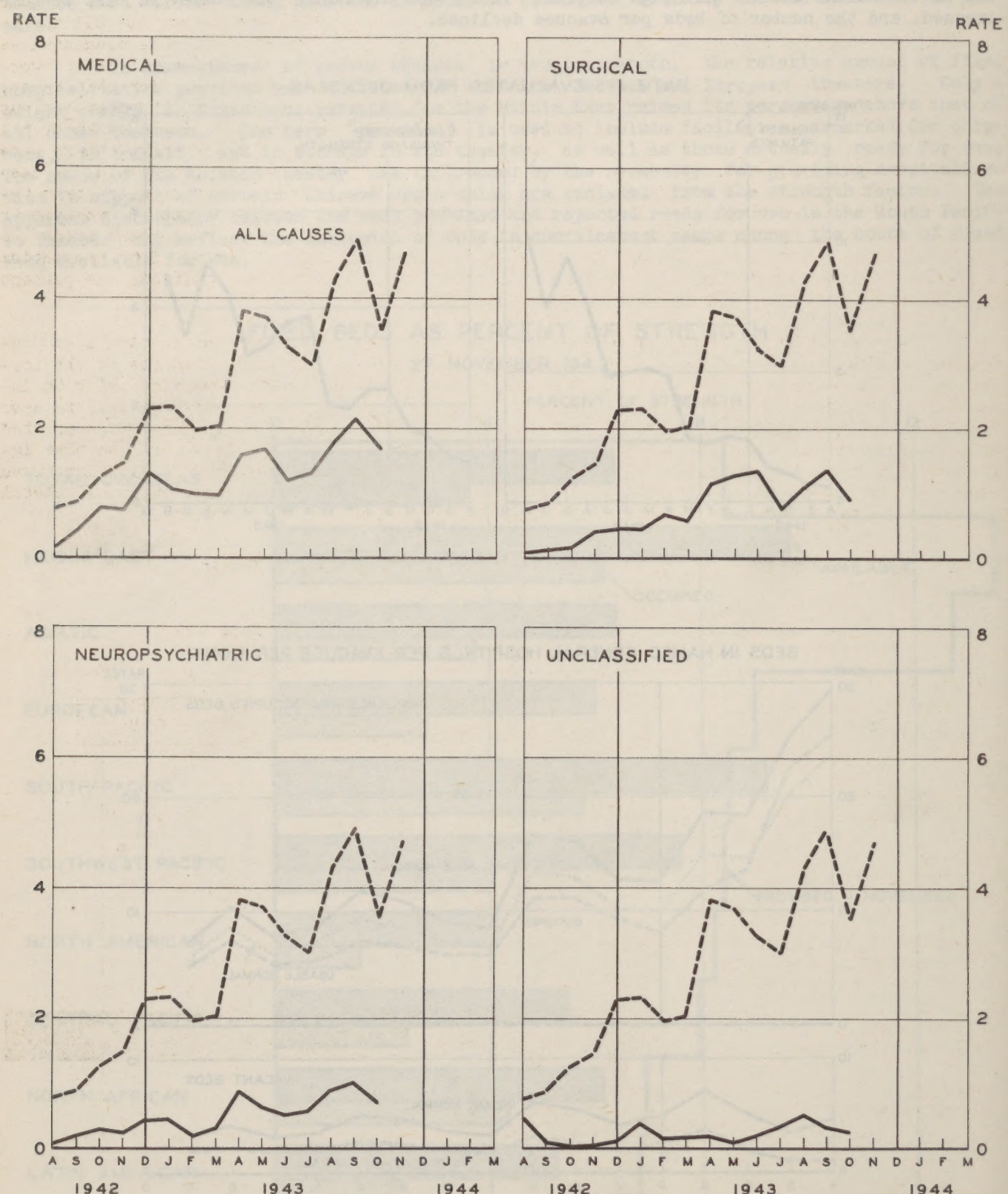
EVACUATION OF PATIENTS FROM OVERSEAS (Continued)

Reports of patients received in U. S. ports from overseas distinguish among medical, surgical, and neuropsychiatric patients. A small number is usually unclassified. The following charts give in rate form the number recieved in each category and permit ready comparison with the rate of evacuation for all types of patients.

PATIENTS EVACUATED FROM OVERSEAS BY TYPE

EVACUEES PER THOUSAND MEN PER MONTH



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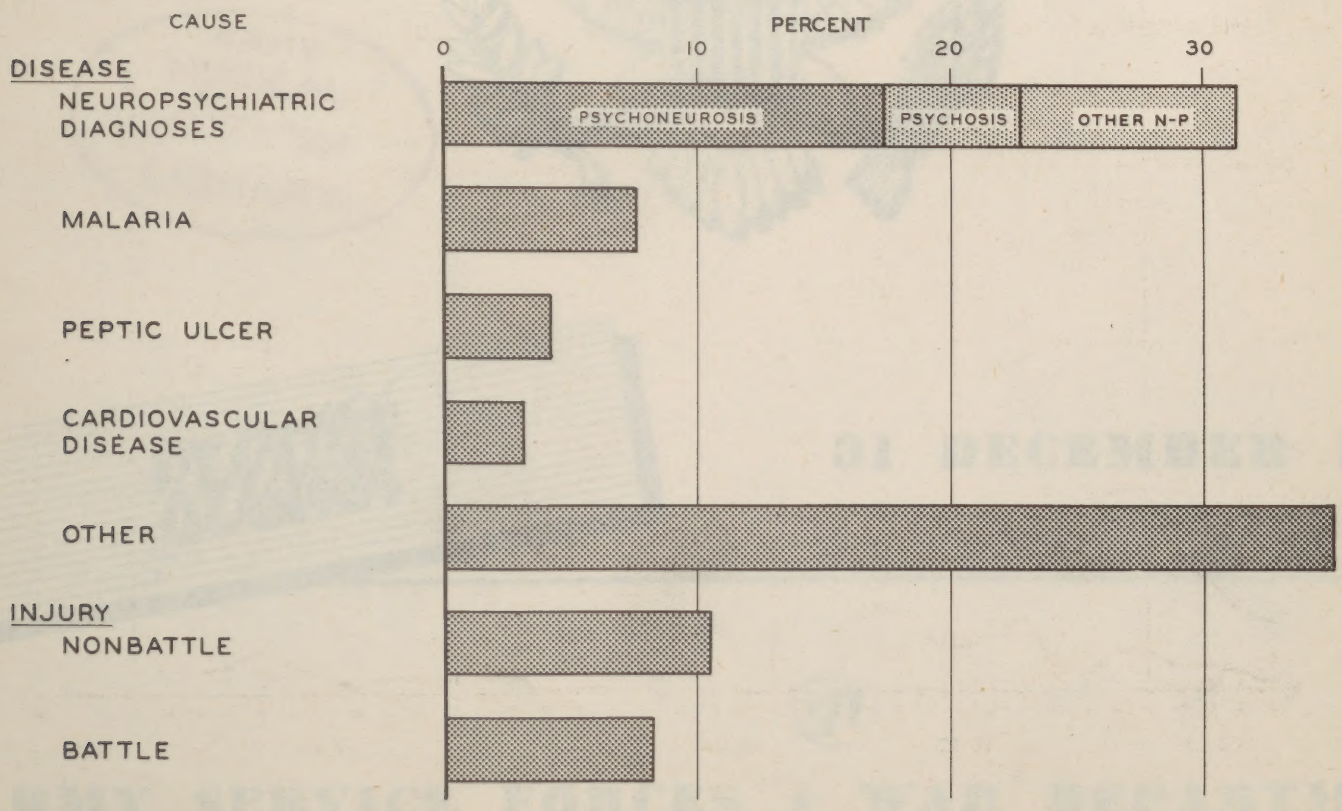
## CAUSES OF EVACUATION FROM OVERSEAS

Recent improvements in the processing of records on evacuees from overseas make it possible for the first time to describe with some assurance the conditions which make it necessary to return patients to the U. S. for treatment and disposition.

A sample of 5,500 evacuees among a total of 7,250 received during October has been classified according to diagnosis, with emphasis upon certain ones of special interest. The first chart below reveals the relative importance of disease, 81 percent having been evacuated for disease in comparison with 19 percent for injury. Only 8.2 percent were battle casualties (one-third caused by small arms, one-third by high explosives, and the rest by bomb fragments, mines, other causes, and unclassified causes). Thirty-one percent of all the evacuees were neuropsychiatric cases of one kind or another, but chiefly patients diagnosed as psychoneurotic. Although malaria alone is insufficient reason for evacuation, it is noteworthy that 417 cases, or 7.6 percent of the sample studied, were evacuated for this cause. Presumably they were suffering from chronic malaria or had one or more of its most serious complications. Peptic ulcer was also tabulated separately, and found to include 226 or 4.1 percent of the cases. In addition to the diagnoses shown separately in the chart, there were 5 cases of amoebic dysentery, 2 cases of bacillary dysentery, 25 cases of filariasis, 37 cases of neurocirculatory asthenia, 22 cases of rheumatic fever, and 1 case of mite-borne typhus. There were 35 patients with injuries which had necessitated amputations of one type or another, 18 or 4.0 percent among the 449 battle casualties and 17 or 3.0 percent among the 575 nonbattle injury cases. Classification of all the patients suffering from traumatism shows that 52 percent of the 1,024 cases had injuries involving the extremities, 14 percent head and neck injuries, and 6.5 percent chest injuries.

A recent report from the Middle East, giving a diagnostic classification of 885 evacuees to the U. S. between 1 July 1942 and 15 October 1943, includes estimates of the percentage of cases in which the cause of evacuation was believed to have existed prior to induction or enlistment in the Army. Forty-six percent of all the evacuees are said to have been relieved as physically unfit for duty in the theater because of conditions which existed prior to induction. The percentages are especially interesting for certain of the more important diagnoses. For example, 63 percent of those returned for psychiatric disorders were evacuated for causes which are said to have existed prior to induction. For musculo-skeletal disease this percentage was 59, and for both peptic ulcer and asthma it was 58.

PERCENT OF PATIENTS EVACUATED DURING OCTOBER, SELECTED CAUSES



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